VOL. XXII. NEW YORK—THURSDAY, JUNE 9, 1910—CHICAGO No. 23

THE AUTOMOBILE

"GOOD ROADS"

ATLANTA, GA., June 6—Most important of the events of the year is the "Good Roads Tour," which made an early start from Atlanta this morning. The advance guard was represented by a patrol of mounted police supported by a fire wagon, and the tooting of its siren proclaimed to the world that 71 entrants, with their splendid automobiles decorated with flying banners, and bound by the tradition which is at the foundation of Anglo-Saxon success, had started to blaze the way of the Great National Highway, which is being advocated by the sponsors of this tour in the guise of the New York *Herald* and the Atlanta *Journal*, and which is to dissolve the Mason and Dixon Line, mingle the thoughts of the North and South, and cement the world efforts of the two great sections of the country for the common good.

As the roll of honor was gradually unfurled before the keen and riveted gaze of Georgia's best citizens who were assembled there to do honor to the occasion, the cars checked off, each in its proper place, all in the pink of condition, and with a certain synchronized inter-relation of the sound emanations due to the cycle rhythm of the sturdy power plants which were there as the direct representatives of the automobile engineers who work in American plants and evolve the mechanisms which are as the keystone which ties the arch fashioned from the automobile on the one hand and good roads on the other.

The music rendered up by a mass-band bade a parting farewell, the strains of which greeted the ears of the occupants of the automobiles which made up the rearguard, and the assemblage rent the air with prolonged cheers as the grand parade straightened its line for its onward march, heading for Anderson, S. C., over the route which the Columbia Pathfinder had pioneered.

Pleasant Atmosphere

After getting under way on Monday, the participants soon brought away a full realization of the seriousness of the undertaking. When the cars rolled off of Atlanta's splendid pavement, and the oil-like consistency of Georgia's clay began to coquette with the tire-bound wheels of the automobiles, skill on the part of the pilots of the cars was brought into greater prominence, and the little pleasantries which flitted over the assemblage at departure were supplanted by the more serious views which portrayed a stern reality fraught with possibilities, intermingling even dangers. As the day wore on, and the June sun began to paint the western horizon, a recount of the day's work included no accidents of a serious nature, unless, perchance, tire trouble, of which there was enough.

The Locomobile, entered by John W. Grant, was not so fortunate as the other automobiles; it skidded into a ditch, and an inventory of the damage done included a broken spring. This incident transpired at a point some 40 miles from Atlanta, but Mr. Grant had company in his misery, which included Charles T. Smith, of Concord, who

From Martinsville to Staunton, in Virginia

drove a Maxwell; also Emmett Callan, of Washington, Ga., in a Maxwell; they, too, had spring breakages to record.

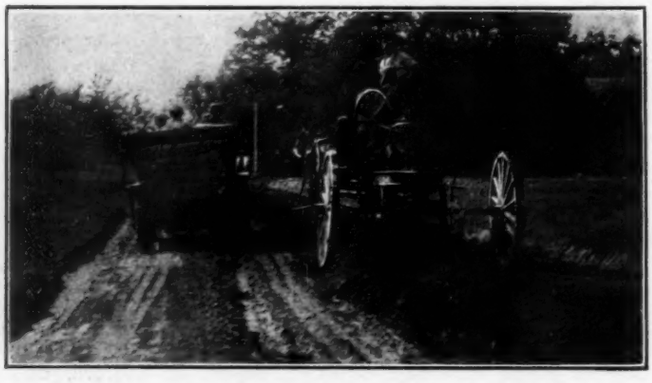
From Atlanta, all along the line, the farmers gathered to witness the passing of the automobile procession. At Norcross, which is a small suburban town, there was a solid line of people, which, including farmers' teams, gathered at the crossroads, not forgetting a vast display of automobiles, which were lined up along the curb, made a brave showing.

If the Norcross citizens did themselves proud, they were staunchly supported in a thousand ways; steam whistles shrieked a welcome everywhere; negro laborers and their families paid tribute to the automobile, and the citizens of Norcross, who were represented by an enlightened committee, put up a big sign at the edge of the town, which intercepted the thousand-eyed cavalcade, and it read, "speed limit 110 miles." From Norcross on to Duluth, the ovation was never-ending, being in the main a repetition of that which went before, varying in some measure, and limited only by the ingenuity of the citizens, whose enthusiasm knew no bounds.

As an unpleasant accompaniment to an otherwise agreeable situation, such of the contestants as were less fortunate than their sportsman-like competitors, fell by the wayside, as tires became unruly. Just outside of Duluth the Jackson, No. 42, with C. D. Smith, of Albany, Ga., accompanied by Mrs. Smith, W. N. Tickner, and a pleasant party, succumbed to a puncture, and the broad smiles which illumined the countenances of the party was barely equal to the character of the illumination which was generated by four additional punctures before Auburn was reached. There were the customary number of little incidents which peppered the situation from time to time, rendering it rather the more savory, perhaps, than otherwise. The Velie car, on nearing Winder, cast up a variety of motor trouble, which lost to it a noticeable measure of time.

State Lines To Be Crossed Through Floral Arches

The friendly frontiers of the respective States will vary such monotony as there may be in divers ways. At Knox's Bridge, in South Carolina, a floral arch was placed at Fairplay; every tourist received a postal card from the debutantes, who were voted pretty, and the noted hospitality of the South was notched up for the occasion. The 266 occupants of the 70 automobiles which are participating in the tour were so stunned by the overwhelming attention which they received at Atlanta, that when they departed at 8:30 on Monday morning, with the "God Speed" of Mayor Maddox, the latter with his staff, including Fire Chief Cummings and his "red devil," were reduced to comparative silence, but they have since awakened to the splendor of it all and they expend between times on the tour, vying with each other in praise of the great Southern metropolis and its hospitable inhabitants.



Working on New Road Which Leads to Winston-Salem

ANDERSON, S. C., June 7—The first day's run was not without its strenuous possibilities, while the path, considering it in general, was all that could be anticipated. There were wet roads to encounter, due to rain which fell in that section of Georgia on Sunday afternoon, continuing over until Monday morning.

Cars as They Are Entered for the

No.	Cars.	Contesting Entrants.
1	PACKARD	Beaumont Davison, Atlanta.
2	NATIONAL	W. J. Stoddard, Atlanta.
3	THOMAS	Colonel J. J. Woodside, Atlanta.
4	PACKARD	R. E. O'Donnelley, Atlanta.
5	KNOX	Joseph F. Gatins, Jr., Atlanta.
6	POPE-TOLEDO	Edward M. Durant, Atlanta.
7	LAMBERT	W. S. McNeil, Jr., Atlanta.
8	REGAL	Regal Motor Car Company, Detroit, Mich.
9	LAMBERT	W. T. McNinch, Atlanta.
10	WHITE STAR	Atlanta Motor Car Company, Atlanta.
11	AMERICAN TRAVELLER	Jackson P. Dick, Atlanta.
12	MAXWELL	Maxwell-Brisco Motor Company, New York.
13	SIMPLEX	Edward H. Inman, Atlanta.
14	MAXWELL	C. W. Dupre, Marietta, Ga.
15	COLUMBIA	Charles I. Ryan, Atlanta.
16	BUICK	W. E. Wimpy, Atlanta.
17	CHALMERS-DETROIT	J. H. Marsteller, Roanoke, Va.
18	STEVENS-DURYEA	Forest Adair, Atlanta.
19	FORD	E. M. Willingham, Atlanta.
20	HUPMOBILE	N. W. Wallace, Charlotte, N. C.
21	POPE-HARTFORD	P. S. Arkwright, Atlanta.
22	FIRESTONE-COLUMBUS	A. Burwell, Jr., Charlotte, N. C.
23	BRUSH	Brush Automobile Company, Atlanta.
24	KISSEL KAR	Kelly-Knight Motor Car Co., Atlanta.
25	SPEEDWELL	Arthur T. Smart, Atlanta.
26	E-M-F	Georgia Motor Car Company, Atlanta.
27	THOMAS	Mrs. Elizabeth A. de Giers, New York.
28	FIRESTONE-COLUMBUS	E. D. Crane & Co., Atlanta.
29	STODDARD-DAYTON	W. D. Alexander, Atlanta.
30	LOZIER	Asa G. Candler, Jr., Atlanta.
31	MAXWELL	Maxwell-Briscoe Co., Tarrytown, N. Y.
32	LOCOMOBILE	John W. Grant, Atlanta.
33	HUPMOBILE	E. D. Crane & Co., Atlanta.
34	CORBIN	T. H. Cooper, Salem, Va.
35	STEVENS-DURYEA	C. H. Johnson, Atlanta.

The clay roads, of which a considerable portion of the pathway is composed, were, in the vernacular of the natives, "as slippery as oil." The running time of the cars for the first day was as follows:

HOW THE CARS WERE STRUNG OUT ON THE PATH

Class 1—Allowed Time, 10 Hours 48 Minutes

No. 20, Hupmobile, 10 hours 23 minutes; No. 23, Brush, 8 hours 46 minutes; No. 31, Maxwell, 9 hours 15 minutes; No. 33, Hupmobile, 8 hours 53 minutes; No. 37, Brush, 10 hours 13 minutes.

Classes 2 and 3—Allowed Time, 9 Hours 53 Minutes

No. 7, Lambert, 9 hours 31 minutes; No. 8, Regal, 8 hours 40 minutes; No. 10, White, (steamer) 8 hours 55 minutes; No. 12, Maxwell, 7 hours 51 minutes; No. 14, Maxwell, 8 hours 19 minutes; No. 19, Ford, 9 hours 37 minutes; No. 22, Hudson,

9 hours; No. 24, Kissel Kar, 8 hours 14 minutes; No. 41, Ford, 8 hours 35 minutes; No. 43, Maxwell, 8 hours, 57 minutes; No. 50, Cole, 9 hours 34 minutes; No. 51, Reo, 8 hours 25 minutes; No. 53, Cadillac, 9 hours 16 minutes; No. 57, Buick, 8 hours 49 minutes; No. 59, E-M-F, 10 hours 1 minute; No. 60, Buick, 9 hours 3 minutes.

Classes 4, 5, 6 and 7—Allowed Time, 9 Hours

No. 1, Packard, 8 hours 27 minutes; No. 2, National, 8 hours 24 minutes; No. 3, Thomas, 8 hours 49 minutes; No. 4, Packard, 8 hours 51 minutes; No. 5, Knox, 8 hours 43 minutes; No. 6, Pope-Toledo, 8 hours 50 minutes; No. 11, American Traveler, 8 hours 29 minutes; No. 15, Columbia, 9 hours; No. 13, Pope-Hartford, 8 hours 24 minutes; No. 16, Buick, 8 hours 30 minutes; No. 17, Chalmers, 8 hours 45 minutes; No. 21, Pope-Hartford, 9 hours 52 minutes; No. 25, Speedwell, 9 hours 46 minutes; No. 26, E-M-F, 8 hours 43 minutes; No. 28, Firestone-Columbus, 8 hours 30 minutes; No. 30, Lozier, 8 hours 14 minutes; No. 34, Corbin, 8 hours 8 minutes; No. 35, Stevens-Duryea, 8 hours 37 minutes; No. 36, Halladay, 8 hours 33 minutes; No. 38, Winton, 8 hours 32 minutes; No. 39, Selden, 9 hours 30 minutes; No. 40, Speedwell, 7 hours 54 minutes; No. 42, Jackson, 10 hours 30 minutes; No. 45, Thomas, 8 hours 34 minutes; No. 46, Mercer, 8 hours 4 minutes; No. 48, Ohio, 8 hours 22 minutes; No. 49, Pullman, 7 hours 57 minutes; No. 52, Oakland, 8 hours 29 minutes; No. 56, Columbia, 8 hours 57 minutes; No. 58, Palmer-Singer, 7 hours 54 minutes; No. 61, White (Gasoline), 8 hours 42 minutes; No. 62, Cadillac "30," 8 hours 18 minutes; No. 63, Stevens-Duryea, 7 hours 40 minutes; No. 65, Maxwell, 10 hours 20 minutes; No. 69, Columbia, 8 hours 26 minutes.

Long Trek from Atlanta to New York

No.	Cars.	Contesting Entrants.
36	HALLADAY	Georgia Commission Company, Albany, Ga.
37	BRUSH	John Moore & Co., New York.
38	WINTON SIX	Herman J. Haas, Atlanta.
39	SELDEN	J. E. Brown, Atlanta.
40	SPEEDWELL	S. M. Smith, Bluefield, W. Va.
41	FORD	Dr. E. C. Seawright, Fayetteville, Ga.
42	JACKSON	C. D. Smith, Albany, Ga.
43	MAXWELL	Julian H. Reynolds, Augusta, Ga.
44	MITCHELL	L. S. Brown, Athens, Ga.
45	THOMAS	Roy Collier, Atlanta.
46	MERCER	Mercer Automobile Co., Trenton, N. J.
47	PULLMAN	W. G. Humphrey, Atlanta.
48	OHIO	Ohio Motor Car Company, Cincinnati, O.
49	PULLMAN	Pullman Motor Car Company, York, Pa.
50	COLE	Carter & Logan Brothers, Savannah, Ga.
51	REO	A. P. Herrington, Atlanta.
52	OAKLAND	Robert Campbell, Cedartown, Ga.
53	CADILLAC	D. K. McColl, Bennettsville, S. C.
54	STEVENS-DURYEA	J. L. Henderson, Hampton, Ga.
55	OHIO	M. L. Thrower, Atlanta.
56	COLUMBIA	Marcellus Rambo, Birmingham, Ala.
57	MITCHELL	Good Roads Committee, Winston-Salem, N. C.
58	PALMER-SINGER	R. D. Apperson, Lynchburg, Va.
59	E-M-F	R. G. Scruggs, Waycross, Ga.
60	MOON	W. P. Walthall, Atlanta.
61	WHITE GASOLINE	Gaston Gunter, Montgomery, Ala.
62	CADILLAC	W. H. Peacock, Cochran, Ga.
63	STEVENS-DURYEA	Mrs. Myrtle M. Barnes, Montgomery, Ala.
64	BUICK	L. S. Collier, Atlanta.
65	MAXWELL	Charles T. Smith, Concord, Ga.
66	WHITE STEAMER	Edwin P. Ansley, Atlanta.
67	MAXWELL	Emmett Callan, Washington, Ga.
68	NATIONAL	F. J. Cooledge, Atlanta.
69	COLUMBIA	John W. Mangham, Griffin, Ga.

The Schedule Beat Some of the Automobiles a Little

The first report over the wire, which has, of course, to be verified in the final sum-up, gives the cars by names as follows, as having fallen behind the schedule:

From Atlanta to Anderson, Near the Mountain House

No. 21, Pope-Hartford, entered by Preston S. Arkwright, of Atlanta, fined 50 points; No. 25, Speedwell, entered by Arthur T. Smart, of Atlanta, fined 43 points; No. 42, Jackson, entered by C. B. Smith, of Albany, Ga., fined 77 points; No. 55, Ohio, entered by M. L. Thrower, of Atlanta, fined 12 points; No. 65, Maxwell, entered by Charles T. Smith, of Concord, Ga., fined 77 points; No. 32, Locomobile, entered by John W. Grant, of Atlanta, had the misfortune to break a wheel, and just how much of a penalty will be attached to this incident, is yet to be made known. Up to midnight of the first day's run, this car had not put in an appearance, but word was received at Anderson that the car is on the move, and it should catch up before the end of the second day. No. 47, Pullman, entered by W. G. Humphrey, of Atlanta; No. 9, Lambert, entered by J. T. McNinch, of Atlanta; No. 44, Mitchell, entered by L. C. Brown, of Athens, Ga.; No. 67, Maxwell, entered by Emmett Callan, of Washington, Ga., checked in at 11:40 P. M. to-night.

The distance from Anderson to Charlotte is 158.8 miles, as the pathfinder surveyed the route. The time of running is to be a duplicate of that which obtained between Atlanta and Anderson.

Charlotte, N. C., Marks End of Second Day

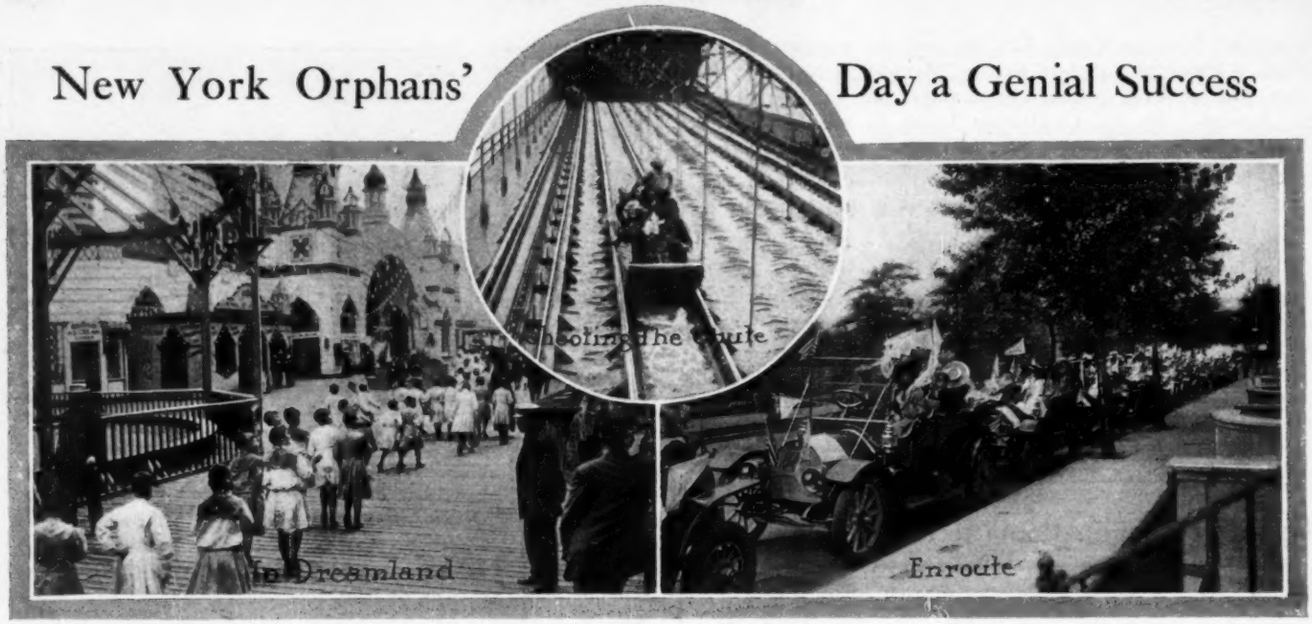
CHARLOTTE, N. C., June 8—Common accord of the tourists voices a single sentiment; it has for its plaint the fact that Charlotte did itself so proud and offered such a wide diversity of entertainment that it was a mistake to so fix the itinerary that the tour could not linger there for at least another day. The run from Anderson to Charlotte was one of consuming interest. There was but one accident of moment; it fell to the lot of the Stevens-Duryea car, which belonged to Mrs. M. L. Barnes, of Myrtle, Ala. Approaching Greensville, at an ugly point in the road, the car broke out of control and a summary of the happenings of the time included a broken front wheel. Mrs. Barnes is making a strenuous effort to have the wheel replaced by a new one, which will have to come from Greensville.

Along the route at every point of vantage grandstands are

(*Continued on page 1066.*)

The Road to Rocky Mount Was Not of the Best

New York Orphans' Day a Genial Success



LEFT—Orphans Never Knew of a Place Like Dreamland Before. RIGHT—On the Ocean Boulevard. TOP—Shooting the Chutes

FOUR miles of automobiles, laden with 3500 happy little children, inmates of 22 of New York's orphanages, made a trip to Coney Island, Thursday. The children were the guests of the Orphans' Automobile Day Association of New York and they had a royal time.

There were 400 cars in the procession and an effort was made to maintain 50-foot intervals during the run. Aside from the fact that the truck divisions contained 32 big machines, the feature of the parade this year was the presence of 120 taxicabs in line. There were over 200 touring cars, most of them privately owned and donated for the occasion. Fifteen sight-seeing cars, three opera 'buses and several automobile stages were in line.

Some of the youngsters were picked up as far away as Yonkers, thus the ride they had was nearly 75 miles long, but the average was in the neighborhood of 30 miles.

At 10 o'clock in the morning, under unpromising weather conditions, the head of the procession began to move amid the delighted shouts of the little ones. Every car was bedecked with streamers announcing that its destination was "Dreamland" and nearly every child had been furnished with a small American flag. So when the cars straightened out over any stretch of street that was without curves, the line of automobiles had a gay appearance. Sections of the cars had been delegated to get the youngsters at the various institutions and the parade formed on the cross streets between Seventy-ninth and Seventy-second streets with the head of the column resting at Seventy-eighth street and Broadway.

The route followed was down Broadway to Forty-eighth, to Fifth avenue to Fifty-seventh, thence to Second avenue and across the Queensboro bridge and by a devious route through Brooklyn to the scene of the annual merry-making.

There were six bands in the procession and after the cars had reached their destination, the musicians furnished a variety of tunefulness for the benefit of the big crowd. Every show in Dreamland was open to the kids and they Shot the Chutes and did various other things until they were tired.

But first of all, immediately after reaching Coney, the little ones were filled up to the last notch with a tasty dinner provided by Hugh Chalmers and served in one of the immense dining-rooms of the resort. Three times the great hall was filled with the clamoring children, who were ready to do justice to a far less toothsome spread.

Col. K. C. Pardee, president of the Orphans' Day Association and secretary and general manager of the Maxwell-Briscoe Company in business life, presided. Col. Pardee was decorated with a sample of all the badges used in the parade and presented a smiling face to the little ones from above the riot of color lent by the bright badges.

Alex. Schwalbach, secretary of the association, was in direct charge of the details of the affair and spent probably the busiest day of his life in handling all the questions that arose.

It is estimated that the cars in line represented a total valuation of over $2,000,000.

One of the effective things about the affair was the interest displayed in it on the part of the public. Everywhere along the route of the procession, crowds gathered and watched the progress of the cars and cheered the little ones heartily. The parade was for their benefit and it was given by motordom of New York and when these two phases of the idea became connected in the minds of the interested public, the result was a long series of smiles. It was freely estimated that the automobile was brought into close touch with thousands of persons during the parade whose idea of the motor car was something hostile to safety and well-being. After seeing the thousands of happy children, whose day of pleasure had been given them through the instrumentality of automobile owners, even the most prejudiced among the observers, at least had good grounds upon which to found a more charitable attitude of mind.

Splendid Line of Automobiles Waiting for the Many "Fares"

It is doubtful if any similar affair was ever carried out with the same amount of careful adherence to pre-arranged rules. Everything worked out with mechanical precision from the start, clear through the long program, to the safe return of the children to the institutions.

The affair was a notable success from every viewpoint, and plans for next years are already being discussed.

Dead Horse Hill's Record Still Stands

F. A. Wheelock in Stayer-Chicago "24 in Dead Horse Hill Climb
F. A. Babcock in "1 Babcock Dead Horse Hill Climb
Stearns "18 Driven by R. H. Higgins in Event 2-A

LEFT—Winner of event 12B. CENTER—The only electric that contested. RIGHT—Stearns had a walkover in second event

WORCESTER, MASS., June 6—Records were made in the fifth annual hill climb held on Dead Horse Hill Saturday afternoon, under the auspices of the Worcester Automobile Club, among which were three in events under the price classification, three in the piston displacement classes and the Worcester County amateur championship event. In the free-for-all contest, however, the performance of the Stanley steamer last fall stands as the record of the hill.

While the fields were small in all the events, the racing was spirited and spectacular and Worcester took an afternoon off and attended the affair in force to enjoy the sport. The hill, which has always been known as a killer of horses, is a mile long, rising 325 feet in a series of short, sharp jumps. It had been put in excellent shape for the racing with the idea of setting a new mark for the hill, but Caleb S. Bragg's Fiat Special was unequal to the task of bettering the former record.

The Staver-Chicago car, entered in Event 12B, for cars with piston displacement of from 161 to 230 cubic inches, a newcomer in this section, won the first honors in competition with three others. The car demonstrated excellent speed and hill-climbing qualities and was well handled by F. A. Wheelock. In this event the Cole "30" was second, close to the winner; the Maxwell entry and the Lancia were unplaced. The winner set a new mark for its class.

The showing of the Jackson entries was prominent, winning Events 4A and 14B and finishing third in the free-for-all and lowering the record for cars of 301 to 450 cubic inches displacement and also for those listed at from $1,600 to $3,000.

The little Cameron beat the former mark for cars of its class selling between $801 and $1,200, and the Thomas made a new record for those listed at from $1,600 to $2,000.

The Stearns entry negotiated the hill with a full complement of passengers, but was not forced to high speed, as it had no opposition in the only event in which it competed.

The Stanley steamer in the Worcester County amateur championship event, and driven by its owner, Jay Clark, Jr., won the race in 1:09 9-10, giving Mr. Clark ownership of a handsome trophy, he having won two legs in the two preceding years.

One of the most interesting performances of the afternoon was that of the Babcock Electric, which covered the route at a twenty-mile-an-hour gait, taking the hills without making any fuss. This event was carded as Number 21, and the electric was the only starter. Its time was 3.00 9-10.

The Alco won Event 15B without opposition; Event 18, one of the free-for-all affairs, and was second in the Record of the Hill event. It was also second in the main free-for-all. The car set a new mark for the 451 to 600 cubic inches displacement class.

In no less than six of the events there was but one entrant—the Thomas Flyer, in Event 1A, the Stearns in 2A, the Atlas in 3A, the Cameron in 7A, the Alco in 15B, and the Babcock Electric in Event 21 all having walkovers.

There were several motorcycle events carded, the best showing in which was made by B. A. Swenson (Indian), who made 1.03, and Edward Jerome, on a similar machine, who made 1.10 7-10.

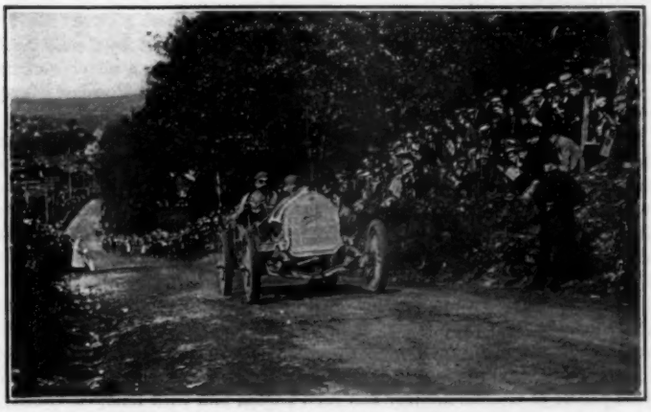
The contest was under the direction of John P. Coghlin, former president of the club, who acted as chairman of the committee on arrangements, assisted by George D. Webb, Albert H. Inman, Daniel F. Gay and Milton C. Snyder. C. Howard Gillette, president of the Automobile Club of Hartford, was referee, and L. R. Speare was honorary referee.

The judges included the following, several of whom are presidents of outside automobile clubs: A. D. Converse, H. R. Burbeck, A. E. Bliss, A. E. Lerche, F. S. Matthewson, W. A. Thibodeau, J. Fortescue, W. H. Chase, Ira C. Coombs, John O. Heinze, A. G. Pattison, F. M. Barber and Chester I. Campbell.

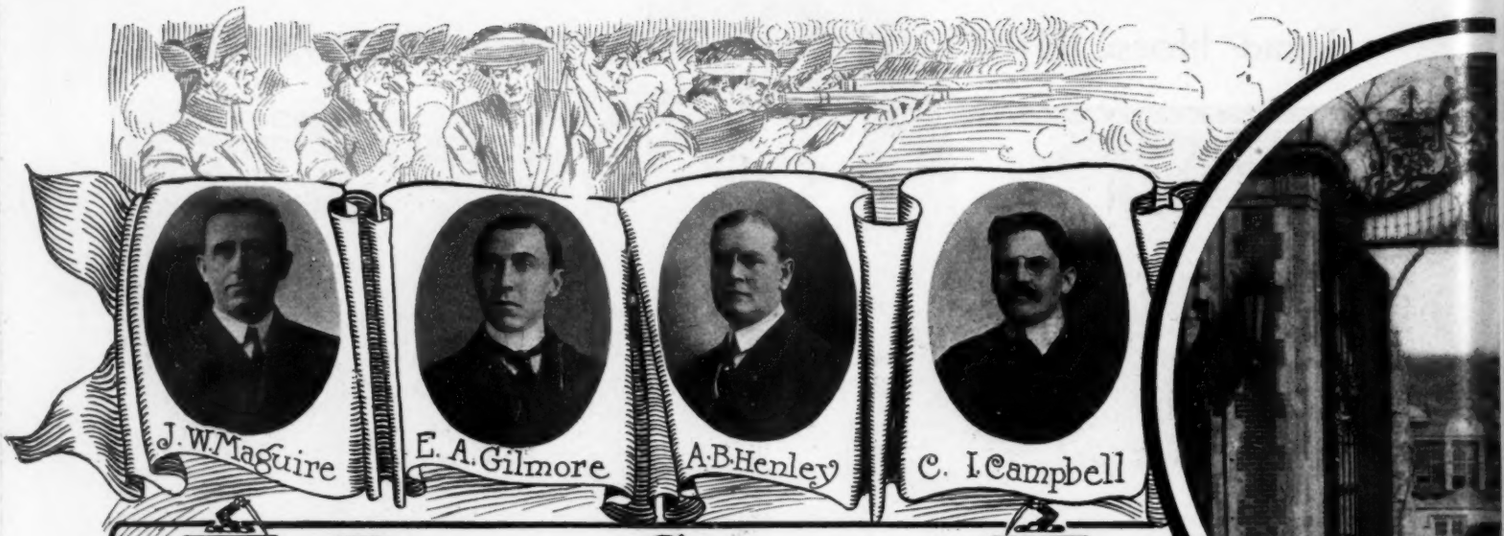
The timing was under the direction of David L. Gallup. Fred J. Wagner started the cars and Charles F. Webb was clerk of the course. The scoring was done by Frank L. Coes.

The officers of the Wor-

(*Continued on page 1066.*)



Jackson Won Two Events on This Occasion



Bay State

DURING the few years that represent the period of the automobile, Boston has progressed and developed along all lines of human advancement at a much higher rate than it achieved in any period of similar length in its history. Despite all her historic mile-posts in the record of the nation, the modern progress of Boston is her chiefest civic jewel. There has been a metamorphosis worked into the life of The Hub during the past ten years and to an appreciable extent it has been due to the automobile.

Boston is not pre eminent in the manufacture of motor cars, but it possesses all the potential factors that go to make up a rich field for their use. It is a wealthy, industrious city which boasts of its advanced thought, culture and education; so when the vogue of the motor came about, Boston at first accepted it and then made it its own.

Foremost among the expressions of motordom in Boston is the Bay State Automobile Association. This organization throughout its history of over five years has been one of the potent forces of the sport, industry and social influence of the motor car. It has been high in the councils of the city, state and nation, and no body of motorists in the land has had more to do with shaping the popularization of the American motor car than the Bay State Automobile Association.

Concord Bridge

The association has been effectively active in doing things that tended to increase the interest in motoring in New England. To no small extent it has worked to make the Boston Automobile Show one of the largest and most important functions of motordom. The Boston show ranks with those of New York and Chicago, as a result of this industrious interest.

The Bay State was one of the first organizations to take up the matter of endurance runs on such a basis as to make them valuable as tests and examples of automobile efficiency and reliability. It inaugurated the famous "Climb to the Clouds" up the rocky sides of Mt. Washington, as a club event, and the existing record for the climb is held by a Boston man, William Hilliard. Charles J. Glidden, founder of the Glidden Tour, is a member of the association and the first few events held under that title included Boston in their itineraries. Summer and winter at the earliest period of the endurance run, the Bay State conducted such competitions. As examples of its enterprise in this direction, the fact may be noted that one of the early runs of the association was to Keene, N. H., and return, and another was to Providence, Worcester and back to Boston in the dead of winter. The last contest of this sort that was held by the association was the famous run to Bretton Woods in the White Mountains, some 400 miles long. Six cars finished the run with perfect scores and in order to gain a definite result, the officials ordered the contestants to continue night and day in an effort to break the tie. Physical limitations of men and cars finally brought the run to a close.

The international mile championship trophy, offered by Sir Thomas Dewar was won first by Louis S. Ross and later was captured by Fred Marriott, in one of the steam cars manufactured by the Stanley concern. Mr. Stanley is a member of the club. Numerous speedy drivers have been developed by the Bay State, including: Herbert L. Bowden, Harry Grant, who won a Vanderbilt Cup, Joe Matson and Joe Downey.

The association was formed Jan. 7, 1905. L. R. Speare was chosen president. Headquarters were secured at the Hotel Lenox and later the club home was removed to Auburndale. It was found that this location was too far away from the center of the city and the club moved back to town, where a house was leased in Dartmouth Street. After two years in this convenient but expensive location, the club gave it up and took rooms at the Hotel Carleton, where it now is.

Like every other organization that has a real mission, the life of the Bay State Automobile Association has been varied. During its first three years it gained in membership and importance. Then came a split that for a time threatened the life of the body and resulted in a reorganization. This period of trouble happily has been passed and with renewed vitality, the club is reaching out into extended fields. It was the precursor of the

Automobile Association

Massachusetts State Automobile Association, which is one of the main factors in the state in the way of legislation touching the motor car.

The Boston Chronograph Club is another child of the Bay State. This organization of expert timers and scorers furnished the timers for the first of the Vanderbilt Cup races and also for the early race meets on the Florida beaches. All the members of the Chronograph Club belong to the Bay State.

In the way of legislation of a reasonable character affecting motoring, the club has always been active and efficient.

Excessive liabilities caused radical action to be taken at the commencement of the current year. Instead of electing officers as heretofore, the club voted to place its affairs in the hands of a commission composed of L. R. Speare, J. H. MacAlman, E. A. Gilmore, J. S. Hathaway, A. B. Henley, J. W. Maguire, C. I. Campbell and Harry Knights. Each member of the commission is identified with some branch of motoring in an intimate way and under the present administration, the affairs of the club have been straightened out until its future has assumed the rosy hue of hope

The commission first got rid of an expensive lease that hung over the situation like a cloud and since than, by tactful and energetic effort, the membership roster has been swelled until, at present, the condition of the organization is sound and live interest in it has been stimulated.

In the near future, a meeting undoubtedly will be called to elect officers and once more the Bay State will assume the usual form of an automobile club. This may not take place until the first of next year, but the solvency of the organization has been amply demonstrated.

The fundamental purpose of the Bay State Automobile Association is the welfare of motoring. Chief among the necessary elements to make motoring possible are good roads, and consequently, the best effort of the club has always been exerted toward improving the highways. In doing what it has done, it has been aided in large measure by the liberal understanding of the foundation principle of good roads by the agricultural element of the state.

Washington Oak

James J. Hill, one of the constructive financial giants of the age, in a recent statement touching on the high cost of living said that there had been a revolt against working on the farm because of its inaccessibility. He pointed out that high prices of farm products resulted through the action of the law of supply and demand and cautioned the world that the best way to reduce prices was through an increase in supply. In order to increase the supply of farm products it is necessary to make the farms accessible and thus make them attractive to the workers. Prices had advanced 100 per cent in a dozen years and the motive for radical action was very definitely present.

The answer to the problem is simply—good roads and adequate transportation. If the farmer and his wife and family and servants were placed within easy distance of the life, gayety and activity of the city; if it were possible for him to send in his produce quickly, economically and certainly to a broad, living market and to maintain close touch with the world while operating his farm, the result would be unquestionably to make farming more attractive and more profitable. The actual cost of hauling heavy loads over bad roads had eaten up the profits of many a skilful farmer and he was constantly face to face with the question of margin on the wrong side of the book. Then came the motor car; first as the plaything of the rich; then the more generally used pleasure conveyance of the moderately wealthy, and now as a most vital element of commerce

Ride was Stopped

The Minute Man at Concord, Mass.

Massachusetts was among the first of the states to realize the possibilities of good roads. The market gardeners of the Bay State had appreciated their worth early in the epoch of the automobile, and as a result the road situation of the state makes an extraordinary good example of the progress that has been achieved along that line.

How entirely justified their attitude is may be realized from the consideration of the figures that have been given.

Some Requirements of Automobile Gasoline

SENSATIONAL statements, which had for their purport the possible scarcity of gasoline, were made and reiterated with such vehemence a year or two ago, that autoists were constrained to believe that the fuel problem would become the most serious phase of the whole autoing situation within a short time. It was then believed that hexane was the only suitable distillate of the hydrocarbon series which would properly serve in automobile work, which belief was based upon the fact that the volatility of hexane was at the right rate and with sufficient uniformity to serve for the purpose without leaving a residuum.

At that time, there were many geniuses who labored under the false impression that kerosene oil would become the ultimate fuel, and that some different kind of a motor would have to be designed to burn it. Skill always comes to the rescue of the man who nurses a bugbear, and this case proved to be no exception to the rule. Instead of designing a freak motor to burn kerosene oil, it was found to be feasible to design the fuel so that it would burn in an automobile motor, and at the same time avoid having to use the distillate hexane as the sole product, at the cost of an enormous quantity of by-product, which could not be used as rapidly as produced in other arts and industries.

The distillers of oil realizing fully that hydrocarbon by-products, unless they can be utilized in the arts and industries, introduce a formidable problem, due to the fact that these by-products cannot be disposed of in any way, excepting industrially. Were they to be run into a sewer they would reach the waterways, float on the top, and become a menace; likewise to spill them into a depression in the earth, would be to make an artificial liquid hydrocarbon lake which would be a menace also. Enough has been said to indicate that the by-products of the distilling process in the making of automobile gasoline must be regulated to the quantities which will find a use in various ways. When the seriousness of the problem was fully realized, the experts who deal with such matters began experimenting with composite fuel, with the idea of utilizing the entire range of the distilling process, including hexane, heptane, octane, and decane, with perhaps other fractions, should the plan prove efficacious.

It was not necessary to involve the pentane fractions, they being more volatile than hexane, for the reason that these lighter distillates are vastly in the minority and have many uses, so that they may be readily disposed of in the ordinary way. It is fortunate for the automobile situation that the lighter distillates are not so good as automobile fuel; the heat units per unit of weight are less, and the inflammability is in excess of that desired, not only from the point of view of safety, but for the further reason that the rate of flame travel in the compressed mixture in the combustion chambers of cylinders, is in excess of the actual demand, and motors so provided would be prone to knock.

As carbureters were improved, and as automobile engineers arrived on a better basis in their understanding of the requirements, it became apparent to them that there should be a sufficient quantity of the lighter distillates present in the total fuel to permit of starting a cold motor without having to crank, beyond the mere spinning of the motor, as an outside limit. Automobile fuel, to satisfy this phase of the situation, must hold enough hexane to serve as the volatile member of the family, after which it may be diluted with the heavier distillates, even beyond the point marked decane.

Bosch Dual Ignition System Explained

STABILITY of ignition for motors, considering the nature of the service and exposure to the inclemency of weather and lack of attention, or what is more to the point, the kind of attention which emanates from the curiously inclined, is of prime necessity. Realizing this, the Bosch Magneto Co., headquartering in New York City, brought out what is known as the dual system of ignition, which, in addition to a magneto, involves the use of a battery, instead of the employment of a separate times and a multi-coil, though the magneto is so contrived that a suitable interrupter is incorporated into the mechanism and a form of step-up transformer is made to do double duty, serving primarily to spark the latent charge in a cylinder in the act of starting the motor from the seat, and in case the magneto should become deranged the same coil may be brought into play to serve as a substitute sparking system.

The magneto is installed in the usual way, and although the wiring and connections are different, as will be shown, even so the problem is bereft of complexity, and a so-called clean dash is one of the advantages realized. The unit coil, which is of a shape to fit snugly in a circular housing of metal, is so encased as to be water-tight, and the condenser, trembler and switch are included within the housing.

Switch Handy to Get At

The switch is so made and connected as to enable the operator of the car to switch from the magneto to the coil and vice versa at will, and a neutral point intervenes so that the electrical system may be turned off when the occasion requires.

The dual system magneto differs from all others of the same make in that a battery interrupter is added and the connections are altered to suit the occasion.

Neglecting the parts which are required to compose a complete and perfect mechanism, it remains to be observed that there are two separate sets of contacts, each perfectly independent of the other, and either set may be used without the other; nor does it matter if one is out of order—the other will work perfectly in the meantime. The battery contact system, used to interrupt the current flowing from the battery, is just as

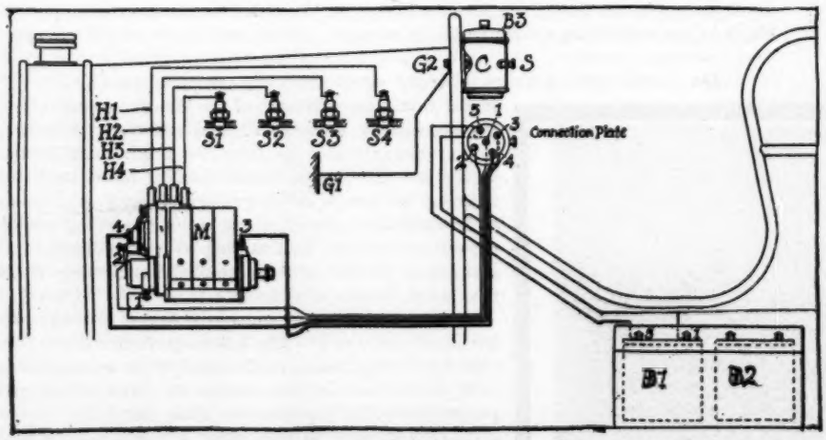


Fig. 1—Diagram of wiring of the Bosch dual ignition system, showing the magneto, spark plugs, dash coil, wiring connections and battery

capable and quite as independent as here arranged as it would be in a separate housing, but it offers the inducement of being in a place of natural advantage and reduces the wiring system to its simplest form.

Diagram of Bosch Dual Wiring System

For a four-cylinder motor the diagram as presented in Fig. 1 will serve the purpose here, although it will be understood that any motor, with any number of cylinders, as usually employed, may be adapted. This system will suffice for ignition purposes. The magneto M is placed at any convenient point, and high tension leads H1, H2, H3 and H4 may be connected to the four spark plugs S1, S2, S3 and S4. In these respects the dual system is no different from the conventional forms of high-tension magnetos.

Back of the high-tension leads, as they pass from the magneto to the spark plugs, the system takes on a dual character, and the connections between the coil C, on the dashboard, the magneto M, and the battery B1 or B2, if a reserve battery is available, should be from No. 1 on the magneto and No. 1 on the battery to No. 1 on the connection plate of the coil C, which is given diagrammatically just below. Nos. 2, 3 and 4 from the magneto should connect to corresponding numbers on the connection plate of the coil, and No. 5 of the battery should lead to No. 5 of the connection plate of the coil. The ground connection G1 to G2 completes the circuit. The connections to the control, which is a switch S, are made when the system is assembled, and in starting all that can be done is to press the button B3 on the top of the coil, when, if the conditions are right in the cylinders, as respects mixture, the motor should start.

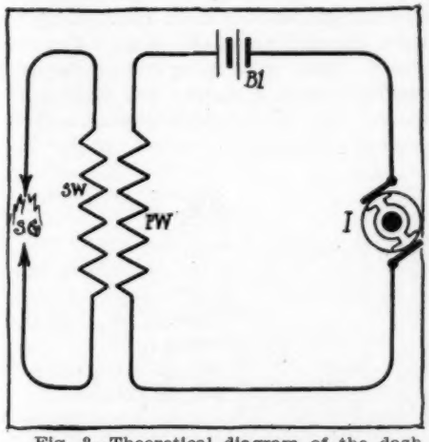


Fig. 2—Theoretical diagram of the dash spark coil, showing the windings of the coil as saw-teeth, spark gap, battery and interrupter

It is generally well understood that a static transformer will not set up an inductive secondary electromotive force when a continuous current is applied to the primary windings of the transformer, and this system mystifies many motorists because they do not understand that static transformers are usually designed for alternating current work, and they do not see wherein the difference lies or why this particular transformer will work and others will not.

There are one or two little details that stand in the way of a perfectly clear understanding of this situation, and those who understand that a coil with a trembler will deliver a spark have only to remember that the Bosch coil, as used in the dual system, is a trembler coil when the button is pressed, and a step-up transformer at all other times. As a step-up transformer it receives its intermittent current in the primary winding, from the battery, to be sure, but the system of wiring is so contrived that the battery current is interrupted by the battery interrupter.

Utility in Sparking

An intermittent current, while it will not deliver a secondary electromotive force holding to the sine form of wave, will, nevertheless, induce a secondary electromotive force that will serve for sparking, when the primary current is so impressed. This is what happens when the battery is cut in by the switch S, Fig. 1, and the system gives one spark per interruption, which is all that is required in ignition work, provided the spark is rightly timed and of sufficient voltage and energy.

Fig. 2 is a diagram of the system, in a characteristic way, in which B1 is the battery, I is the interrupter, PW is the primary winding of the transformer, SW is the secondary winding of the transformer, and SG is the spark gap. In the Bosch dual system, I is located in the magneto for convenience, PW and SW are combined in the coil C, Fig. 1, and the gap SG represents one of the spark plugs S1, S2, S3 and S4, Fig. 1.

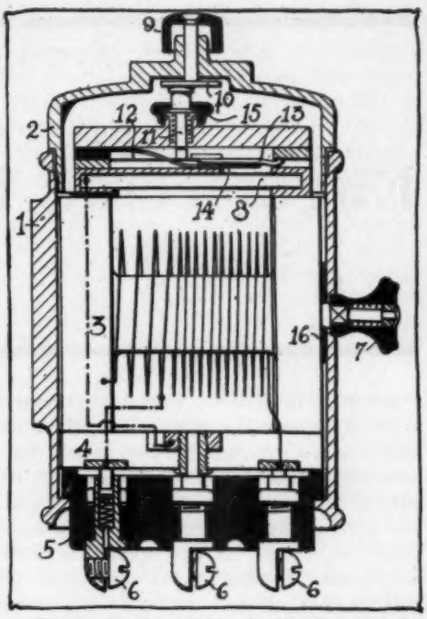


Fig. 3—Section of the dash coil, presenting connections at bottom, magnetic core within with windings thereon, and trembler at top, all within a waterproof case

The practical way in which the scheme is carried out is best shown in Fig. 3 of the Bosch coil in section, which, together with the explanations, affords all the information that can be of any value in view of what has been said. In this illustration, 1 is the cylindrical housing for the coil with its cover cap 2. Within the housing is the soft iron core 3, around which the winding is placed, as shown. The condenser 8 works in connection with the coil. S7 is the switch handle, which protrudes from the coil. Four is the connection plate at the base with which the connections 6 attach. The vibrator parts are shown in the top, 9 marking the press button, 12 the vibrator spring, and 11 the pin for setting the vibrator working. Fig. 4 represents the completed coil in its housing, with the control switch facing the driver. The system is widely used, it offers the advantage of a double ignition, having all the virtues of two independent methods, and the magneto is unincumbered by any part which can be construed as likely to complicate it in any way. The battery is regular, placed as in ordinary system, and starting on the spark, insofar as this plan is possible, is advisable and easily managed due to provision which is made for it. The system offers not the slightest chance for a tinker and an unlicensed screwdriver.

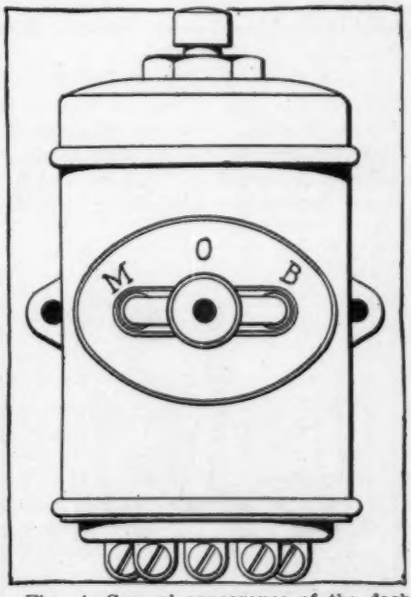


Fig. 4—General appearance of the dash coil, presenting means of opening the top for purposes of inspection and the switch on front for use in turning the magneto, or coil on, also for throwing to neutral or open.

Engineering Digest

A carefully abstracted digest of accounts of engineering activities as they are reported in society transactions and technical papers throughout the world.

Study of Concentric Valves—Concentric valves properly constructed constitute a progress in motor design, according to F. Carlès in *La Vie Automobile* for May 14, and the more general adoption of this type would be desirable, if the elimination of all valves were not more desirable yet. One of the principal advantages of the concentric double valve is the following. The fresh gas, usually at a temperature slightly above that of the surrounding atmosphere, in passing by the exhaust valve contributes to keeping it cool, and the concentric arrangement of the parts obviates that unequal expansion and contraction of parts which sometimes leads to seizures in motors with two distinct valves. The concentric valve permits the designer to give his combustion chamber a cylindrical or even a hemispherical shape, which heats less than the ordinary. But there are also disadvantages. As the gas cools the exhaust pipe it is itself heated and expanded. Figuring it out, one finds that the mixture may readily be raised a hundred degrees in temperature, whereby its weight, and therefore the power of the motor, may be reduced 30 per cent. Also, the weight of the movable parts of the exhaust valve, especially those which are bell shaped, is increased, requiring stronger springs, which wear and strain the cams and rollers. Finally, the concentric valve is expensive. In the Pipe, Fig. 3, the bell shaped exhaust valve is machined from a block of special steel, in order to make it light, but the cost in tool wear alone is considerable. The foregoing leads to the inference that concentric valves are best adapted for a motor in which they may be cooled by water rather than by the explosive mixture. They then offer the advantages of equable expansion and contraction of parts and an opportunity for a hemispherical combustion chamber, without any accompanying drawbacks.

Fig. 1 shows the Esnault-Pelterie valve, used in an aviation motor. The two valves are in one piece, the exhaust valve forming a slide. Both are operated by the same rocker arm. Here lies trouble. At the end of the explosion stroke orifices EE are uncovered and AA covered by the slide. When now comes the time for admission of gas, the valve descends a little more, but for an instant the two orifices are uncovered simultaneously, and there is suction through the exhaust valve. When the valve is closed again the same thing happens once more. Another inconvenience. Suppose the valve is depressed five millimeters for the exhaust; it must then go down still a little further in order to begin to uncover the intake, say two millimeters, and thereafter still farther, say six or seven millimeters, to complete the uncovering of the intake and covering the exhaust orifice. That makes, then, at least 12 or 13 millimeters stroke for the valve stem, even with as scant an allowance for the diameter of the orifices as five millimeters.

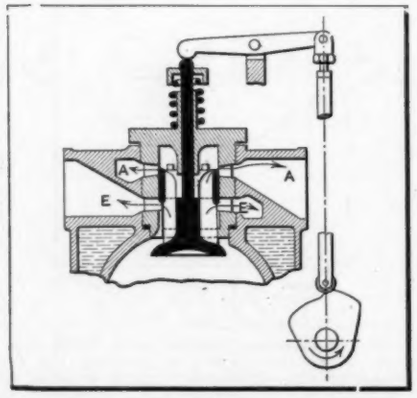


Fig. 1—Esnault-Pelterie valve in position as between exhaust and induction

In the Vorreiter valve, from Austria, Fig. 2, the slide is not integral with the central valve, but abuts against it by means of springs. The two valves are depressed together to permit the exhaust to escape. Continuing to descend the slide valve T reaches a conical seat, and both valve openings are closed. Then the central valve continues to descend, and the admission passages are opened to fresh gas. This arrangement may be suitable for large valves, but if the slide should stick, even slightly, it will no longer follow the intended movements, and in that case the motor will be stalled. The little spring cannot be very strong because it would compensate against the main valve spring (says the author). Also, the multiple conical seats do not appeal to the mechanical sense, and the guidance of the valve and of the slide seems insufficient, judging from the illustration. The total lift must be even higher than in the Esnault-Pelterie valve. Nevertheless, Mr. Vorreiter states that he has obtained a higher thermic efficiency with this valve applied to small motorcycle motors than with separate valves and a 2 per cent. higher utilization of dimensions, but the latter result may be due solely to the improved form of the compression chamber.

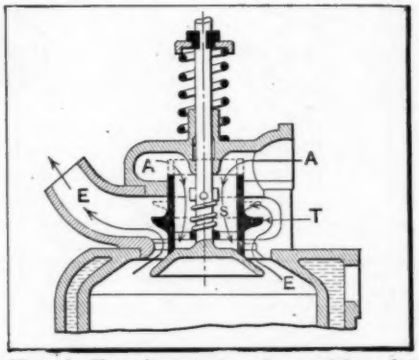


Fig. 2—Vorreiter valve in position for exhaust

The maximum valve lift is normal in the Pipe construction, Fig. 3, as each valve is operated separately, and the guidance is perfect, the induction valve sliding in the exhaust valve and the latter in its seat. In order to leave the slide free to expand and prevent the exhaust gases from entering the admission piping, the slide is provided with a segment upon its upper portion. Two rocker arms are used, A_1 and E_1, that for the exhaust valve being forked, and two tappets, two cams. This complication has perhaps no other advantage than the easier design and adjustment of the cams, but the Pipe system generally carries with it great facility in dismounting the two valves. The seat is screwed into the cylinder head and secures thereby an aluminum valve chamber which carries the induction and exhaust pipes. This valve chamber or box is in common for two cylinders, and remains in place if the valves of only one cylinder are dismounted.

The Panhard-Levassor valve, as applied to aviation motors (for example, in the Tellier aeroplane, which recently flew over Paris), is also designed on the principle of separate functioning

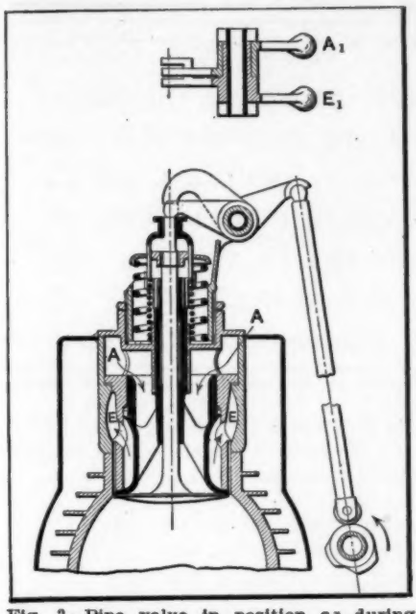


Fig. 3—Pipe valve in position as during explosion stroke

for the two valve members, and has the advantage of normal lift and large apertures for both admission and exhaust, as well as guidance of the slide direct in the seat. It is operated by a single tappet rod, which works by compression for the exhaust and by traction for the admission, see Fig. 4. The rocker arm is forked, and presses on the cover for the upper part of the valve slide, upon which is mounted the small rocker arm *C*. When the tappet descends, the rocker arm, being raised, comes in contact with the small rocker arm which depresses and opens the admission valve. In this movement the tappet and the roller are held down upon the cam by the spring *r*. The exhaust is water jacketed on all sides and the fresh gas is not required to cool the valve seat and is therefore not expanded unduly.

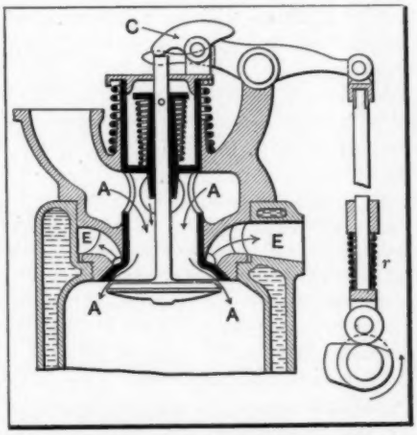


Fig. 4—Valve of P-L aviation motor, in position for admission of gas

In the Miesse valve the exhaust takes place through the center and the admission at the periphery. A single tappet and rocker-arm control the valves, and the lift is considerable. To effect the exhaust the rocker arm presses upon the central valve; this begins to descend allowing the gas to escape by the way of the interior of the bell, until the cap *c*, integral with the central valve, begins to impinge against the bell, thereby closing the aperture for the gas escape. Continuing to descend the central valve carries the bell with it and opens the passage for the fresh charge. The principal objection seems to be that the central valve is never cooled, while the fresh gas enters the cylinder heated, reducing the power of the engine.

Three samples of titanium steel, Siemens-Martin basic process, were obtained at the Osnabrück steel works by running one-half of each of three melts into a ladle, while at the same time adding metallic titanium. The other half of each melt was poured unalloyed (at the same time?). In this way three comparable pairs of ingots, each of more than one ton, were secured, the titanium running 0.038 per cent. in one sample, 0.092 in another and 0.14 in the third. There was no difficulty in getting a mixture in the ladle, and the samples all rolled perfectly sound. Large and small billets were made from the alloyed as well as from the corresponding unalloyed ingots, and from these billets test pieces were rolled and forged. Tensile tests showed greater ultimate strength for the titanium steel than for the corresponding plain steel, the difference being much more pronounced in rolled test pieces than in forged ones, however. By far the most important superiority was in toughness under drop-hammer test. The annealed titanium steel endured four times as violent impacts, in the sample with least titanium, as the plain steel. The composition of the samples was as follows:

	C.	Mn.	Si.	Ph.
I.—Without titanium	.385	1.00	.22	.44
With titanium	.37	1.00	.23	.049
II.—Without titanium	.52	1.36	.22	.078
With titanium	.54	1.33	.32	.07
III.—Without titanium	.48	1.17	.20	.075
With titanium	.48	1.17	.21	.075

The titanium left in the finished metal tested out only from 0.02 per cent. to 0.04 per cent., indicating that its function had been scavenging, taking oxides and possibly nitrogen from the metal. The toughness imparted to high-carbon steel was especially remarkable and in the bending tests the high-carbon sample, containing .52 C., could be bent further than its mate. Fractures of the titanum steel, even of sample I, with only .038 per cent. of titanium added in the ladle, showed a fibrous character similar to that of wrought iron, while fractures of the plain steel were granular. The author calls attention to good results obtained in another case at a crucible steel works by adding aluminum shavings to a strong titanum alloy, before pouring, and to the favorable reports received from the United States, where considerable quantities of titanium steel for rails have been made by adding ferro-titanium in the electric furnace, and where the material has been found superior for rails in wearing qualities and resistance to abrasion.—*Stahl und Eisen,* April 20.

Students of aeronautics may be interested in a new work, 990 pages, "Le Navire Aérien," by L. Marchis, who was recently appointed professor of aviation at the Sorbonne University in Paris. Commandant Voyer, reviewing the work in *Revue Générale des Sciences* for May 15, says it is the most complete in existence, yet the chapter on propellers is lacking, the author awaiting developments on this point.

Metallic, especially aluminum, coatings may be applied by means of steam or gases through a pneumatic nozzle to practically any object or surface. Though the metal must be molten, the metal-laden mist thrown out with great velocity from the nozzle is so thoroughly cooled, through the low temperature of the released gases, that it reaches the object to be coated at temperatures ranging from 10 to 60 deg. C. The process takes the place of galvanizing or tinning and requires no conductivity of the surfaces, or ability to resist heat or water. The coating can be made of any thickness. Steam, if used, must be superheated. The best gas for coating metals liable to oxidation is nitrogen. Hydrogen can also be used. The applications to the automobile industry are obvious, including also the use for patterns, by coating those made of cardboard or wood. (The principle is similar to that used in the improvement of old roads by driving tar into the stone surfaces by air pressure, and recently experiments have been made in New York City with rapid plastering of concrete walls by the same method.) Presented by U. Schoop to the *Académie des Sciences.—Comptes Rendus* for April 25.

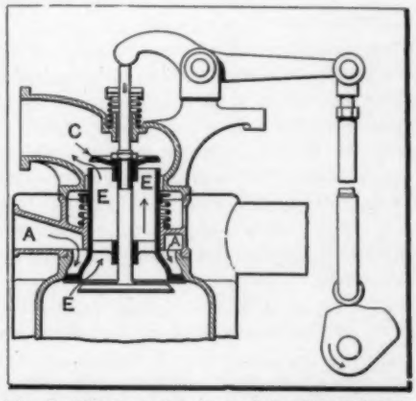


Fig. 5—Miesse valve in position for exhaust

Questions That Arise

A Series of practical questions relating to the automobile, its parts, and their functions, which arise upon various occasions, together with easily understood answers to the same.

[60]—What is the coefficient of friction?

It is the ratio of the force required to slide a body along a horizontal plane surface to the weight of the body. It is equivalent to the tangent of the angle of repose, which is the angle of inclination to the horizontal of an incline plane on which the body will just overcome its tendency to slide. The angle is usually designated as Θ and the coefficient by f. The customary equation for the coefficient of friction is expressed thus:

$$f = \tan \Theta.$$

[61]—Why is there a difference in voltage between charging and discharging a battery?

The chemical reactions during charging are not the same as when the discharging is being done. To obtain the same result it is necessary to maintain the same reaction.

[62]—What is the difference in voltage between charging and discharging of a battery?

According to Prof. Ayrton (Jour. Inst. Elec. Eng., England, Vol. 19, p. 699), the charging voltage during the first two-thirds of the charge is about 0.14 volt higher than the voltage on discharge over the same range. Beyond this point, in the charging period, the difference continually increases. The increase in voltage during charging, over that for discharging, is more than that due to internal resistance of the battery.

[63]—What is the greatest influence for excessive increase in voltage during charging over the voltage realized on discharging?

That it is undesirable to realize a great difference in voltage during charging of a battery over the voltage available during the discharging period is true, and, from the most authentic accounts, it is believed that a condition of persistent sulphation is at the seat of the trouble.

[64]—What is the cause of this persistent state of sulphation?

Allowing a battery to stand in the discharged state; to avoid this state of sulphation it is necessary to charge the battery immediately after it is discharged.

[65]—Will a battery continue to self-discharge after it is partially discharged?

The presence of any lead sulphate at all is enough to induce a condition of "local action," and self-discharging, so called, is but a sign of local action. Sulphate of lead is formed when a battery is in process of discharge, and if any discharging is done at all there will be some sulphate present, so that local action will be induced if a battery is allowed to stand after it is put on discharge. The one way to avoid trouble of this sort is to keep every cell of the battery in good working order and fully charged. A fully charged battery is substantially free from lead sulphate.

[66]—What is the underlying theory of the formation of sulphate of lead in a storage battery of the lead type?

During discharge, the electrodes are reduced to lead sulphate, with the delivery of sulphion from the electrolyte. A general expression of the chemical reactions (not counting divers intermediate reactions) may be taken as follows, according to the accepted idea of storage battery engineers:

$$PbO_2 + 2H_2SO_4 + Pb = PbSO_4 + 2H_2O + PbSO_4$$

This expression includes the combined reactions in the positive and negative electrodes of the cells of battery. They may be separated out in the manner as follows:

Reaction for the positive plates:

$$PbO_2 + H_2SO_4 = PbSO_4 + H_2O + O$$

Reaction for the negative plates:

$$Pb + O + H_2SO_4 = PbSO_4 + H_2O$$

[67]—What is the difference between normal and persistent sulphation in a battery?

Under normal conditions of discharge, it is claimed that the sulphate formation is on the surface of the "active material" and to a certain depth therein. If, on the other hand, the sulphate is allowed to accumulate beyond a certain point, it will ultimately penetrate to the supporting grids. After this condition is established, it is difficult, if not impossible, to realize any further good from the sulphated cell of battery; the sulphate is of high electrical resistance, and its presence between the active material and the supporting grid prevents the formation of the character of active material which obtains when the battery is in a state of proper charge. In addition to this, the sulphate, being in excess, isolates all the available active material by coating over, with the result that it is beyond the reach of the charging current.

[68]—What is the best way to overcome troubles of this sort?

If it can be overcome at all, which is a question, long-continued charging at a low rate is the best course; the electrolyte must be adjusted to proper strength before this "doctoring" charge is administered. Of course it can be overcome to a certain extent; the battery may be corrected in a measure, even in the worst example. That it will ever be as good as under normal conditions, however, is a question.

[69]—Will the life of the sulphated cells of battery be impaired?

It has been found that, after a cell of battery is over-sulphated, the life is but short at best.

[70]—What is the character of the active material which abounds on positive plates of storage batteries?

When a battery is fully charged, the active material is composed of peroxide of lead, the formula of which is PbO_2.

[71]—How much of this material is needed relative to the normal output of a cell of battery?

In the first place, but a small portion of the actual quantity of peroxide of lead on the positive plates is available for use. Of the material which is available, it is claimed that it has a value of one ampere hour for 4.48 grams of material. This is the theoretical value, according to Planté. There is some question as to the accuracy of this figure; it has also been given as 4.44; the Planté valuation is the generally accepted figure.

[72]—Why is it that all of the active material may not be utilized?

Lack of porosity of the active material is one of the great reasons; the fact that the sulphate, after it penetrates to the surfaces of the supporting grids, will induce a condition of abnormal electrical resistance, and defeat charging under effective conditions, must be taken into account. Disintegration of the active material is bound to follow.

[73]—What has porosity to do with the action of a battery?

If the electrolyte cannot "soak in" to the section of the active material, there will be no action at all, for the reason that it is the sulphion in the electrolyte that aids in the formation of lead sulphate; prevent the formation of lead sulphate and the action which is at the bottom of the useful work will be prevented also.

[74]—What is electrolyte?

In a storage battery it is the solution or composition in which the elements are submerged.

[75]—Must it be in liquid form?

No. It is sometimes in jelly formation.

[76]—What is its basis?

In the lead-type of storage battery, electrolyte is made up of a certain percentage of sulphuric acid together with a certain proportion of pure water. The strength, when the battery is fully charged, is 25 degrees Baumé. If it is desired to obtain jelly-like formation, some compound is added to bring about the desired condition. It has not been found that such formations are efficacious; they do eliminate the troubles of having a liquid to deal with, but other troubles are induced, and they have to do with the life and efficiency of the battery.

[77]—What is the nature of the material such as used to solidify the electrolyte?

Silicate of soda-water glass.

[78]—Why should the electrolyte be pure?

Every reaction excepting the normal requirement is at the expense of the life and efficiency of the battery. Some foreign substances act in the capacity of forming ingredients and reduce the life of the battery at a high rate.

[79]—What are forming substances?

Any compound which will, in the presence of an electrical charge, or discharge, reduce metal lead into a salt of lead.

[80]—What has forming to do with storage batteries?

In the process of manufacture of storage batteries, it is the custom to "form" them after they are made up of the desired ingredients. In a Planté type of plate, for illustration, the active material is formed out of the lead of the plate, in the absence of any salts of lead. This forming is done by charging the plates after they are placed in a forming electrolyte. It may be a nitrate solution, or any other solution which will hasten the formation of salts of lead out of metallic lead during the passage of an electrical current through the plates, using the solution to complete the circuit and to act in conjunction with the lead to form salts of lead.

[81]—What has all this to do with the use of storage batteries?

If a battery can be formed at a rapid rate by the addition of nitrates, or other forming ingredients, during manufacture, it stands to reason that this same forming process will be present during the life of the battery in service, if only the nitrates or other forming ingredients are present in the electrolyte.

[82]—If forming ingredients are good to use during the manufacture of a battery, why are they so undesirable after the battery is put into commercial service?

In the process of manufacture, the aim is to continue the forming process until the capacity of the battery is up to the desired standard. Were the process carried on for a longer period of time, the capacity of the battery would be increased, but the life of the same would be decreased, until finally the battery would fall apart; strength of the supporting grids would be insufficient for the mechanical requirement. This same process, if it is allowed to go on after the battery is placed in service, as it would were the electrolyte to be contaminated, would add to the capacity of the battery for a time, but the life of the same would be decreased.

[83]—Which substances must be kept out of the electrolyte?

Everything but water and sulphuric acid.

[84]—How is this possible?

Use pure distilled water and chemically pure brimstone sulphur in the process of manufacture of the electrolyte; after the battery is made, avoid the contamination of the same by keeping the cells sealed and by using distilled water in making up for loss of electrolyte.

[85]—What is the reason for having to add water to the battery in service?

Evaporation of the water is bound to take place at a slow rate, and this loss must be compensated for by adding an equal amount of the same. During charge, when the battery is nearing a condition of full charge, hydrogen and oxygen will be liberated at the nodes, and these gases, as they burst free, will pick up a certain amount of liquid and "spray," which is formed, will shoot out of the cells; this spray is made up of water for the most part.

[86]—Why not prevent the spraying by sealing up the cells?

Were the cells sealed up tight enough, the formation of gas in the manner as stated would cause a gas pressure in the cells, and they would disrupt; in order to avoid the generation of a pressure, the cells are provided with a "vent" which allows the gases to escape as they are formed, but water is prevented from escaping excepting at a very slow rate; water does escape, however, and in time it must be replenished.

[87]—Why is it that water only escapes during the gassing period?

Very little of the sulphion escapes with the spray, for the reason that, during the gassing period, some of the sulphion is mingled with the active material, and the balance, being heavier than the spray, stays behind. Still, some sulphion is lost, and the time must arrive when the same should be adjusted also.

[88]—How is the correction made when the electrolyte falls below the desired strength?

Add a sufficient amount of sulphuric acid to the electrolyte to bring up the strength to the desired level.

[89]—What is the method of procedure?

One way is to draw off a certain quantity of the weak solution, after the battery is fully charged, and add enough strong solution to bring about the desired balance. The strong solution should be made for the purpose of pure ingredients, and register about 30 degrees Baumé.

[90]—Why not add pure concentrated sulphuric acid?

It is dangerous to the one who undertakes it, due to the rapid generation of heat when concentrated solutions of acids are spilled into water or weaker solutions of water and acid. The explosive effect will cause the acid to fly about, and if it contacts with the person who makes such a mistake the result may be very disastrous. If it is not proper to use concentrated solution in a cell of battery, the same objection will be present if the strong acid is used in the process of equalizing.

[91]—Why not empty out all the old acid from the cells and put in new solution of the right strength?

The elements will then be uncovered, and if it is desired to keep them submerged in electrolyte during service, the same requirement will be present during the period of equalizing.

[92]—What is the objection to uncovering the elements?

If the electrolyte is allowed to fall below the level of the active material on the elements, heat and other manifestations of a chemical change will be rendered manifest at once; the active material will harden; porosity will be reduced, and the life of the battery will be much reduced; the capacity will also fall off as the porosity is decreased.

[93]—Will the same amount of water have to be added to each cell of battery during the process of equalization?

No. The loss of electrolyte, while it goes on in each cell of the battery, will not be the same in each. In the process of equalization, there are two points to consider.

(a) Water must be added to keep the elements submerged completely.

(b) The strength of the electrolyte must be maintained equal in each cell of the battery, and, in order to do this, it is necessary to test each cell independently (when the battery is charged and at a constant temperature) and adjust the strength.

Difference Between 2-Cycle and 4-Cycle

Editor THE AUTOMOBILE:

[2,282]—As a subscriber to your valuable paper, I notice that motors are referred to at different times as 2-cycle or 4-cycle. Please advise me what a cycle is, and what is the difference between 2-cycle and 4-cycle. SUBSCRIBER.

La Fayette, Ala.

In the 4-cycle motor there is one power stroke in each four strokes; there are two strokes per revolution of the crankshaft; valves are used to regulate the inflow and exhaust. In the 2-cycle motor there is a power stroke for each two strokes, and ports as shown in Fig. 1, are so placed as to admit the mixture and permit exhaust on each down stroke of the piston. The arrows indicate the direction of flow of mixture from the crankbox and exhaust to the atmosphere. In this illustration, a fan is shown in the act of exhausting. This fan is not used in regular practice, and the exhaust takes place under terminal pressure.

How to Estimate Horsepower of a Motor

Editor THE AUTOMOBILE:

[2,283]—To estimate horsepower of a motor, I understand the process is to square the bore of the cylinders, multiply by the number of cylinders and divide by 2.5. Will you kindly explain what is meant by squaring the bore, giving an example? Also kindly show the process for determining the displacement of a motor, in cubic inches. READER.

New York City.

To square a number is to multiply it by itself, that is to say, the square of 2 is equal to $2 \times 2 = 4$, or $4 \times 4 = 16$, or $16 \times 16 = 256$. Likewise, any number multiplied by itself will give the square of that number. In using the formula, remembering that the power of a motor is in proportion to the square of the bore of the cylinder, the formula may be written as follows:

$$\text{Horsepower} = \frac{\text{bore in inches squared} \times \text{number of cylinders}}{2.5}$$

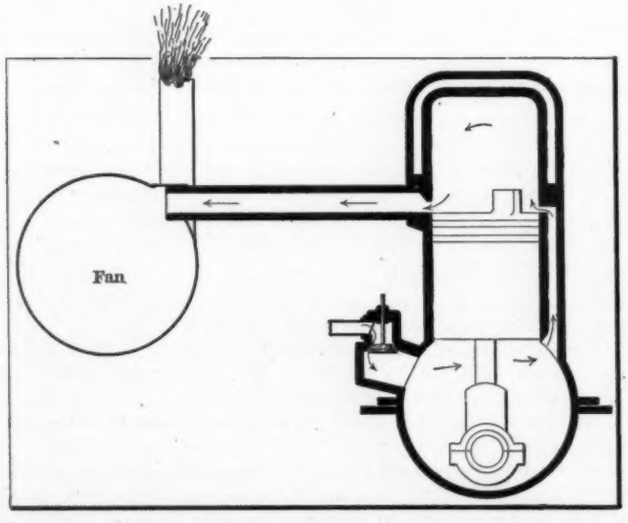


Fig. 1—Typical illustration of a 2-cycle motor with mixture in the crankbox, and an automatic admission valve thereto

For a 4-cylinder motor, if the bore is 4 inches, this formula will give:

$$\text{Horsepower} = \frac{4 \times 4 \times 4}{2.5} = 25.6$$

Using precisely the same method, the horsepower of any motor (according to this empirical formula) may be approximated.

It will be understood that this method of approximating horsepower, while it is a good one in a general way for purposes of comparison, does not give the real horsepower of the motor. The best method of determining the horsepower of a motor is to subject it to a dynamometer test.

Gasoline Is Vaporized by Heat

Editor THE AUTOMOBILE:

[2,284]—I have learned by reading THE AUTOMOBILE that gasoline will remain as a liquid until it is vaporized by the application of heat. I also understand that the reason why gasoline is suitable for use in automobile motors, aside from the fuel value it holds, is because it boils at a low temperature, thus making it unnecessary to utilize special forms of heating equipment in the process. There is one point which is a little obscure in my mind which I will bring out by asking a question. If heat must be transferred to the gasoline in order to vaporize it, is it not a fact that some of the fuel value is lost in the process? In other words, I would like to know the relation of the latent heat of evaporation, and to have you state a method by which the number of heat units involved may be ascertained. SUBSCRIBER.

Newark, N. J.

The amount of heat measured in B. T. U. necessary to raise 1 pound of gasoline 1 degree F. is 0.500 (taking an average value for the character of the gasoline used for fuel in automobile motors), and it therefore follows, as a close approximation, that a drop of 1 degree F. in the temperature of 1 pound of this gasoline corresponds to the transfer of 0.500 B. T. U. of heat. The specific heat of atmospheric air at a constant pressure is 0.2375 B. T. U. and a drop in temperature of 1 pound of air under these conditions is attended by the dissipation of 0.2375 B. T. U. of heat.

Since the best mixture of air and gasoline for automobile work is on a basis of 1:15.39 gasoline and air respectively, the transfer of heat will be as follows:

$1 \times 0.5 + 15.39 \times 0.2375 = 4.155$ B. T. U.

Considering the latent heat of evaporation of gasoline as equal to 210.5 B. T. U., it follows that 210.5 B. T. U. of heat must be supplied either by the ingredients or from some outside source before the liquid will change to gas form. In a carbureter it is necessary to consider that the heat must come from some outside source, and it is for this reason that hot-water jacketing is resorted to. In some cases the heat is supplied by heating the air before it passes to the carbureter and, while this is not the most efficacious way, even so, if the application is well made, it works very well indeed.

At all events the gasoline will not vaporize until the heat balance is established in accord with the requirement as above stated, which to bring about requires:

$$\text{Drop in temperature} = \frac{210.5}{4.155} = 50.66 \text{ degrees F. fall of}$$

temperature of the mixture to accomplish the necessary transfer of heat. Changing temperature, which is present when the fuel is being vaporized, has one other effect that interferes with good carburetion, i.e., the viscosity of the liquid changes, the difference being sufficient to cause the flow of gasoline through the nozzle to increase with temperature enough to upset the balance when the motor is running fast and in a heated condition. The effect of temperature may be stated as follows:

Temperature, °F.....	50	59	68	77	86	95
Weight of gasoline.....	1	1.073	1.145	1.212	1.260	1.335

The difference, as given, is sufficient to cause the motor to perform badly, and to interfere with any automatic means of carburetion.

Motor Compression Is Bad

Editor THE AUTOMOBILE:

[2,285]—I have a single-cylinder car, with a 5-inch bore, which has been run four years. The packing rings in the cylinder are open at the ends 1-16 of an inch, and the compression is bad. Would you advise new rings put in? If so, should the open ends be at the bottom of the cylinder, or turned around so that the ends will be a quarter of a turn from each other?

Dallas, Texas. W. E. GARABRANT.

Replacing the piston rings with new and more perfect rings will be a step in the right direction, but it may not cure the difficulty. The illustration as here given shows two pistons which were photographed after the compression became bad, and the information afforded will bear upon your case. The piston at the left shows unequal wear at P1. This condition suggests that the bore of the cylinder was also worn to an elliptical formation, and it was found in practice that replacing the piston rings did not cure the difficulty, because the new rings, while they were good and true, would not conform to the elliptical curvature of the cylinders, and leakage went on as before. The top ring of the same piston, marked R4, broke off at the joint, because the ring was too large for the bore, and it buckled up, resulting in a fracture at the weakest point. The piston at the right shows substantially the same difficulty, affording, however, the additional advantage of showing the blackened zones on the rings, which were caused when the rings buckled up, due to the fact that they were not left sufficiently open at the joints. In making a repair of this character, it is necessary to regrind the cylinder, if it is not true, and replace the rings if they are not in good order.

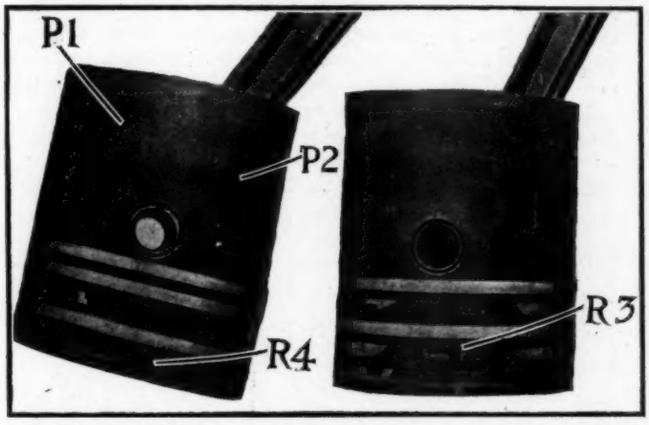


Fig. 2—Reproduction of worn out piston and rings showing how piston deformed and the rings fractured because the space at the joint was insufficient.

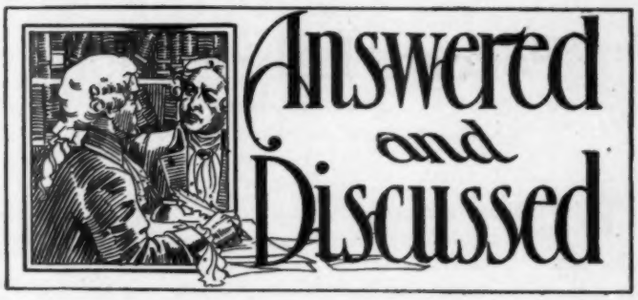
Magnetism in the Core of a Coil

Editor THE AUTOMOBILE:

[2,286]—I do not understand how magnetism circulates in the iron core of a spark coil. What has the iron to do with it?

Buffalo, N. Y. NOVICE.

Referring to Fig. 3, the "lines of force" are indicated by a series of loop-like lines, some of which pass through the ends of the core, and others through the diameter. When an electric current is impressed on the windings around the core, magnetism is set up in the iron core. This magnetism would be present were there no core of iron, but the magnetic flux would be less dense per unit of area in the absence of the iron core because the magnetic reluctance of air is far greater than that of iron. The iron, therefore, is utilized for the purpose of intensifying the density of the magnetic flux, so that the secondary electromotive force of the coil will be a maximum. The iron used must be of a special soft grade, of great purity, and preferably in the form of a bundle of wire. The density of the magnetic flux will be maximum at the mid-section between the boundaries A—B and A1—B1, tapering off towards the end as indicated.



Which Is Better, Long or Short Stroke?

Editor THE AUTOMOBILE:

[2,287]—One prominent manufacturer of motor cars makes a long-stroke engine, 6-cylinder, 40 horsepower, and puts up some fine arguments in its favor, yet in their larger car the engine is 5¾ x 5½. This is puzzling to laymen. Will you please enlighten?

Birmingham, Ala. ZIMMERMAN.

Not necessarily either. It is presumed that you mean when you say, "the stroke is long" that the length of the stroke exceeds the bore of the cylinder. Taking this for granted, the question of the advantage of the long stroke is one which cannot be discussed on an abstract basis. The world is so full of long stroke motors, which are wholly incapable of serving as power plants for automobiles, that it would lead one to the conclusion that the quality of a motor is not merely wrapped up in the ratio of bore to stroke. There are a hundred things to consider, and when they are all reduced to a relation involving harmony, the motor may be thoroughly good with a long or a short stroke. Lengthening the stroke, if the design is proper, adds to the power of the motor, considering a given bore. On the other hand, increasing the bore adds to the power of a motor for a given stroke.

What Has Color of Spark to Do with It?

Editor THE AUTOMOBILE:

[2,288]—Please answer in your inquiry columns, which is the best spark for a coil, a blue or a yellow spark? SUBSCRIBER.

Plainfield, N. J.

The spectroscope, which is an instrument employed in determining the composition of bodies by color comparison, has never been successfully employed in connection with the spark at the gap of a plug in an ignition system of an automobile. The best spark is the one which dissipates the largest amount of energy in the gas, and the measurement of the energy cannot be accomplished by the simple method of gazing at the spark and deciding that it is good because it is yellow, or better because it is blue. It would be something of a gain were one to be able to arrive at the conclusion that the spark is "vicious." This is not even possible by measuring the electrical energy.

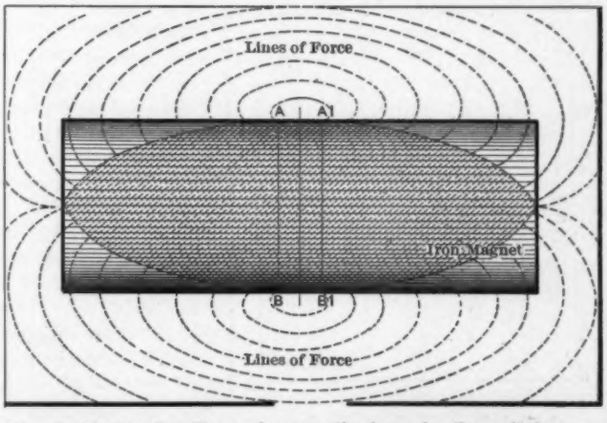


Fig. 3—Illustrating lines of magnetic force in the soft iron core of a spark coil showing how some of the lines short circuit through the diameter.

Forced Lubrication

(First Installment.)

By R. K. MORCOM, Mem. I. of A. E.

Paper read on Wednesday, May 11, 1910, at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, London, S. W. Dr. H. S. Hele-Shaw, F.R.S. (President of the Institution), in the Chair.

THEORY and practice of lubrication are subjects of such importance that it is not surprising to find a very extensive literature on them.

The mathematical theory has been well treated, and experimental figures of a varied nature are available to confirm or correct the theoretical treatment. While taking for granted the established results of those who have investigated the matter, it may be useful to any who wish to refer to the original communications to give a slight bibliography.

Beauchamp Tower—Proc. I. M. E., 1883, 1885, 1888, 1891. Reports on Friction Experiments. These classic researches were made chiefly on pedestal and saddle bearings. The pressures were taken to high figures, but the speeds were not high. The investigations on the oil film are particularly interesting.

Osborne Reynolds—Trans. Royal Society, 1886. This gives a full mathematical treatment of Tower's results, and may be taken as the foundation of the modern theory of lubrication.

Nicholson—Trans. Manchester Association of Engineers, 1907-8. A useful paper and discussion. It co-ordinates the results of various investigators, among others—
Stribeck (Z. d. V. d. Ing. September 6, 1902).
Helmann (Z. d. V. d. Ing. Vol. 49, p. 1161).
Sommerfeldt.

Ewing and Jenkin—Phil. Trans., 1879. On starting from rest.

Lasche—Traction and Trahsmission. January, 1903. Also published separately, "On the Design of Bearings for High Speeds." An interesting account of experiments for the A. E. G. Radiation from and cooling of bearings and variation of temperature from point to point are among its most interesting sections.

Morcom—I. M. E., 1897. Deals particularly with double-acting engines using forced lubrication.

Goodman—Pamphlet on "Friction and Lubrication of Cylindrical Journals," 1890.

Archbutt and Deeley—Treatise on "Lubrication and Lubricants."

Thurston—"Friction and Lost Work."

A number of other papers might be quoted, but these give considerable information and fairly cover the ground.

The one outstanding conclusion is that the modern theory of lubrication is the theory of the oil film. The old ideal of a coefficient of friction gives place to the more suggestive theory that the resistance to motion is due to the shearing of a film of oil, which more or less completely prevents metallic contact and abrasion. The importance of the film is shown by considering that the resistance of a fully lubricated surface may be only one per cent. of a similarly loaded surface in which an oil film is not maintained. Resistance to shearing depends upon the viscosity of the lubricant, thickness of the film, and the area of film in shear. The temperature of the film may alter its viscosity; the extent of the film may not be equal to the extent of the bearing; the thickness of the film may not be such as to entirely prevent abrasion, and the clearance in the bearing may be irregularly distributed and inaccurate, and similar disturbances may be created by bad alignment of the shaft or its springiness, so it is not possible to entirely solve the problem. As usual in engineering, theory may direct or explain practice, but experience must determine it. Certain positive conclusions, however, may be taken as established:

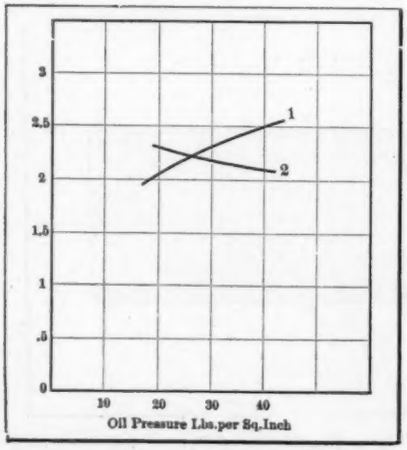


Fig. 1—Chart which is designed to give the horsepower with loads of 186 pounds and 5,130 pounds respectively

(1) The resistance decreases with the thickness of the film.

(2) The resistance increases with the viscosity of the lubricant very materially.

(3) The point of nearest approach is approximately 90 degrees from the line of load.

(4) The points of maximum and minimum oil film pressure are approximately at equal distances from the point of nearest approach.

(5) As the speed increases the points of maximum and minimum oil pressure get further and further apart, till at very great speeds they are in the line of load.

(6) As the speed increases the eccentricity of the oil film becomes less.

(7) The concentric position is the one of least resistance.

(8) Oil should be supplied at a point where the supply pressure is greater than the film pressure.

(9) The loading for a given speed must not exceed a certain limit at which the oil film is broken.

(10) This limit may be increased by lengthening the bearing, so increasing the cooling influence on the bearing.

(11) Oil grooves wrongly placed may destroy continuity of the film.

(12) A motion of pure rotation produces automatic maintenance of the film, provided the supply is adequate.

(13) The temperature varies throughout the bearing, the highest temperature being at the point where the film is thinnest.

Further, in the case of a reciprocating load we know that

(1) A reciprocating load irrespective of rotation produces automatic lubrication.

(2) Heavier mean loads can be supported if the direction of load is reversed, because the lubricant is more vigorously sucked in, and the retardation of surfaces approaching one another normally increases very rapidly as the film becomes thinner.

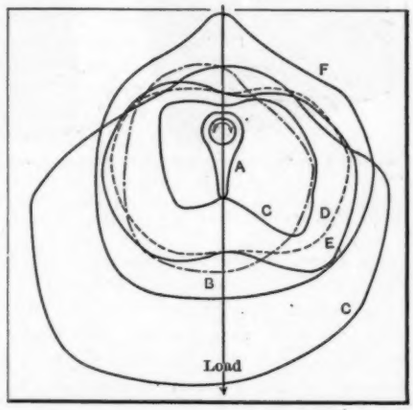


Fig. 2—Diagrams of oil pressures at various points given in section to clear the text

Generally speaking, failure of lubrication is caused by rupture of the film due to:

(a) Inadequate supply of lubricant

(b) Reduction of the viscosity arising from excessive heating, either general or local.

(c) Badly placed oil grooves.

(d) Overloading.

(e) Grit.

(f) Impurities, such as water, reducing the film-forming quality of the oil.

Assuming that the bearings are not overloaded, that system of lubrication will be best which best ensures that other causes of failure shall not occur.

The more one studies the question the more does forced lubrication best appear to meet the requirements. Its acknowledged superiority over other systems for high-speed steam-engines sug-

gests its adoption for the motor car engine. Various splash and gravity systems have been very carefully designed and worked out for car motors, and the success attained is great—so great that it is easy to argue that the success is good enough. But practice in the long run always pronounces in favor of the theoretically best, and it is this which explains the increasing favor with which pressure supply meets.

In the last installment of this article will be given particulars of the lubrication systems of a number of well-known motor cars. There are no fewer than eighteen examples using oil under pressure. The data which various manufacturers have kindly supplied will, it is hoped, serve not only to establish this point, but also to indicate accepted practice as regards the arrangement, etc.

There is considerable difficulty in obtaining full figures and particulars of up-to-date results and methods, such as oil consumptions, oil temperatures, wear over long periods, oil grooves, etc., and the table is necessarily long and incomplete. In fact, information about forced lubrication, both descriptive and experimental, is rather scanty. Nearly all the experimental work has been done on bearings lubricated by other systems.

Some experiences with forced lubrication do not at once fit in with theory, and it may be of interest to describe a few observations and experiments.

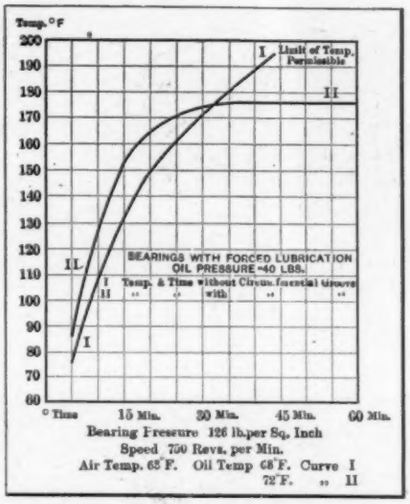


Fig. 3—Bearings with force feed lubrication with a pressure of 40 pounds per square inch, showing resultant temperatures

One of the most obvious things to examine was the actual saving in friction, if any, which occurred with forced lubrication. A trial was made on a 120 b. h. p. engine at 450 revs. per minute. The engine was run unloaded with oil pressures of 30 lbs. and 5 lbs., and without pressure, the supply being maintained with a syringe. A large number of no-load cards were taken and the i.h.p. averaged out. The results of the trial showed:

(1) That the engine was quieter the higher the pressure.

(2) The friction i.h.p. averaged 2.13, 2.41, 3.33, with 30, 5, 0 lbs. pressure respectively.

There is some trouble in explaining this result, for one would expect the cooler oil and more complete oil film with the higher pressure to increase rather than decrease the resistance. Some light is thrown on the case by the quieting action, which means that the film thickness in reciprocating bearings was better maintained. In addition such a result may occur in a steadily loaded bearing, owing to the more copious supply preventing excessive local heating of the film, leading to rupture. This is borne out by the experience that an engine with forced lubrication takes longer to "run in" than one with splash or gravity supply, and further that its bearings take longer to take up a high polish.

Such a result was obtained in an experimental bearing.

A 4 in. shaft was run at 1,000 r.p.m. in two bearings 10 in. long; between these was a bearing 10 1-2 in. long, loaded by means of a spring and lever. The outer bearings were supplied by a gravity supply, the inner at varying pressures. The journal was driven by an electric motor. Curves 1 and 2, Fig. 1, give the horsepower with loads of 186 lbs. and 5,130 lbs. respectively. The temperature was 168° F. in the one case and 200° F. in the other when run for some time at 25 lbs. pressure oil supply.

A series of trials were taken with a load of 24 lbs. per square inch on a bearing 10 in. long by 4 in. diameter. The bearing had a horizontal oil groove cut, and this was tried in four positions:

(1) On the loaded side.

(2) Opposite the load.

(3) On the right-hand side at right angles to the load, with rotation as in Fig. 2.

(4) Opposite to (3).

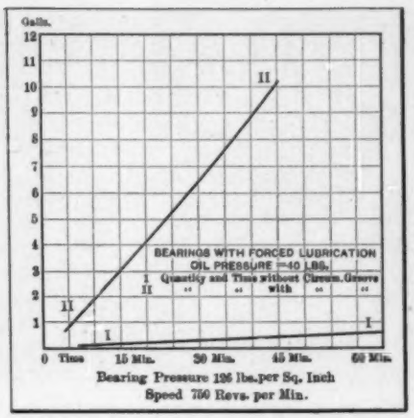


Fig. 4—Chart of the quantity of lubricant circulated, giving the time, speed and pressure

Diagrams were taken of the oil pressure at various points, a selection of such diagrams being given in Fig. 2. The curves may be compared with those composed by Dr. Nicholson from Sommerfeldt's figures.

The index to the curves of Fig. 1 is as follows:

A. 500 r.p.m. 20 lbs. per sq. in. oil pressure.
Groove position (1) 24 lbs. per sq. in.

B. 1,000 r.p.m. 20 lbs. per sq. in. oil pressure.
Groove position (2) 24 lbs. per sq. in.

C. 1,000 r.p.m. 20 lbs. per sq. in. oil pressure.
Groove position (1) 24 lbs. per sq. in.

D. 1,000 r.p.m. 40 lbs. per sq. in. oil pressure.
Groove position (1) 24 lbs. per sq. in.

E. 500 r.p.m. 40 lbs. per sq. in. oil pressure.
Groove position (1) 24 lbs. per sq. in.

F. 1,000 r.p.m. 40 lbs. per sq. in. oil pressure.
Groove position (2) 24 lbs. per sq. in.

G. 660 r.p.m. 20 lbs. per sq. in. oil pressure.
Groove position (2) 126 lbs. per sq. in.

Run at 1,000 r.p.m. and 40 lbs. per sq. in. oil pressure, the final oil temperature reached was taken and found to be:

Oil groove in position (1) 74° F. above air temperature.
" " (2) 62° F. " "
" " (3) 60° F. " "
" " (4) 62° F. " "

It would appear that position (3) is the best position.

A further series of trials were run at heavier loads with spring loading. It is unnecessary to give the trials in detail. The most important conclusion to be drawn was that the benefits of forced lubrication were best realized with a circumferential groove, which enabled heavy loads to be taken at high speeds.

As an example, the curves in Figs. 3 to 5 give temperature, e.h.p. and quantity of oil passing with 126 lbs. per sq. in. loading, 750 r.p.m. and 40 lbs. oil pressure. The curves II. are with circumferential groove; the curves I. are with two horizontal grooves 2 1-2 in. apart on top of bearing, joined by a short circumferential arc.

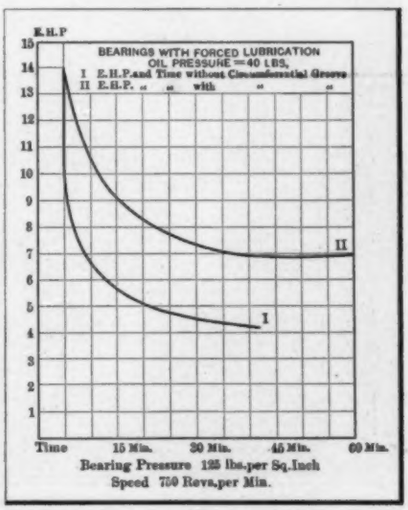


Fig. 5—Chart of the relation of power and time with lubricant circulating under a pressure of 40 pounds per square inch

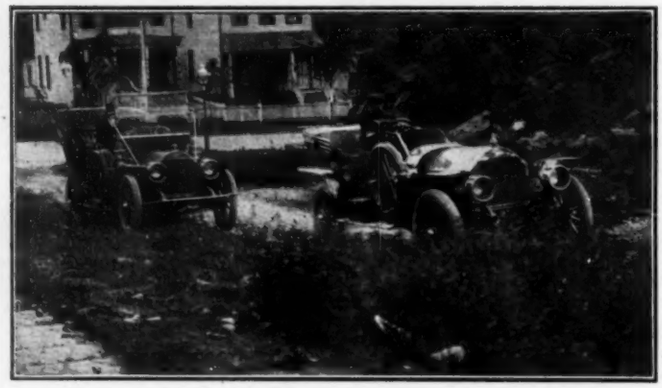


Fig. 1—In approaching an automobile to pass it, if it is desired to get into trouble, pass it on the right, as here shown

The Wrong Way to

INFORMATION for the owner seems to be of the varied sort, with enough and to spare, especially if account is taken of the apparent fact that the "good advice" so freely offered betimes is rarely taken seriously. Perhaps the character of the material is below the level which merits notice; it may be that it is too freely offered, or the true answer to the enigma may lie in some long-forgotten channel. At all events, it seems as if some way ought to be contrived which will fill the want. That there is a vacancy is assured from the very fact that accidents do happen with almost slavish regularity, and when the reason is sought out, it generally results in disclosing a lack of appreciation of the good that is in the "rules of the road."

If the average beginner cannot be reached by any method of telling a direct story, it may be that a reversal of the direct method will serve the purpose. How not to drive, then, is the gist of this plaint, and in order to be able to tell it in the language that will carry conviction, it was considered necessary to take two automobiles out on the highway, and have the "staff photographer" record the doings. The illustrations offered with this article do not represent the actual happenings of autoists who violate the principles of safe and legal driving, but they do show how to go about it if accidents are courted.

Some of the Relations of Automobiles to Roads

The power plant of the automobile is there placed to propel the car; it furnishes the stamina, so that when it is desired to go, it is necessary to turn on the power. The power plant, then, is placed to accomplish a certain purpose, but it must be understood that it is also capable of being the source of damaging occurrences. When the automobile is brought up to speed, it is necessary to steer it along the roadway in such a way that it will keep on that part of the same that is fit to run over, and it is also desirable to avoid trying to occupy space that is taken up by another automobile or a horse and wagon.

If the automobile is going faster than a vehicle ahead, it follows that it is either necessary to slow down, or turn out in order to clear the vehicle ahead during the period that both vehicles are abreast of each other on the road. In order to slow down, if that is the choice, brakes must be used, and, while they are supposed to stand a considerable amount of rack, the fact remains that they do hard work, and they are likely to become deranged. If it is desired to generate an accident just at such a time, the right way to go about it is to have the brakes in a state of bad repair, so that, when it is necessary to bring the automobile to a stop, or to slow down, they will be incapable of performing their proper functions.

Fig. 2—In order to smash a front axle, or damage the steering gear, take to the tall grass to one side of the road and engage, at close quarters, a concealed boulder, as here indicated.

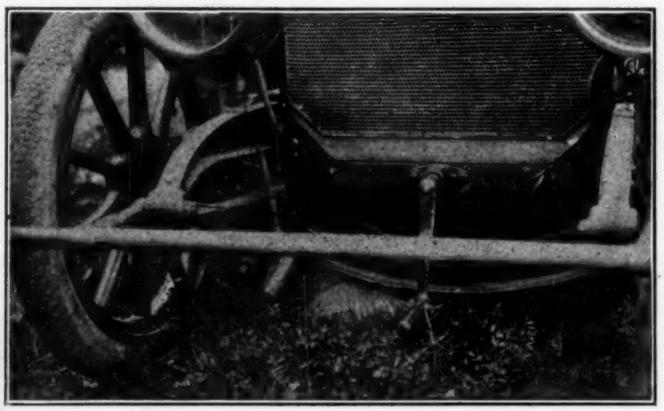


Fig. 4—The boulder on which the front axle rested after it was driven on the wrong side of the road in passing a car ahead

If it is desired to pass the vehicle ahead, the next question is, how will it be done if it is proposed to have a rear-end collision with the car ahead, or to damage the car which is in the position of having to pass the other. Fig. 1 is offered as the right way to pass a vehicle ahead in the process of looking for trouble. In this case, as the illustration portrays, the rear automobile was held in check until the roadway was narrow, and it was then turned to the right instead of to the left, then accelerated in order to make more speed than the car ahead, and started on its course to certain ruin.

Fig. 3—How the automobile was elevated sufficiently for the front axle to lift clear of the boulder shown in Fig. 4

Drive an Automobile

While it is true that the plan was merely to illustrate the way which leads to trouble on the road, the joke proved to be on the experimenters, and as the rearmost of the two automobiles plowed its way through the grass on the wrong side, it intercepted a boulder which was hidden by the tall grass, as shown in Fig. 2, with the result that the front axle of the automobile bounced up and landed fair on the top of the boulder after driving the same ahead for upwards of six inches, in addition to forcing it into the earth for a distance.

Trouble Came in the Form of a Boulder

Fortunately, the front axle was a stout one, and the only problem was to get the stranded automobile off the rock. This

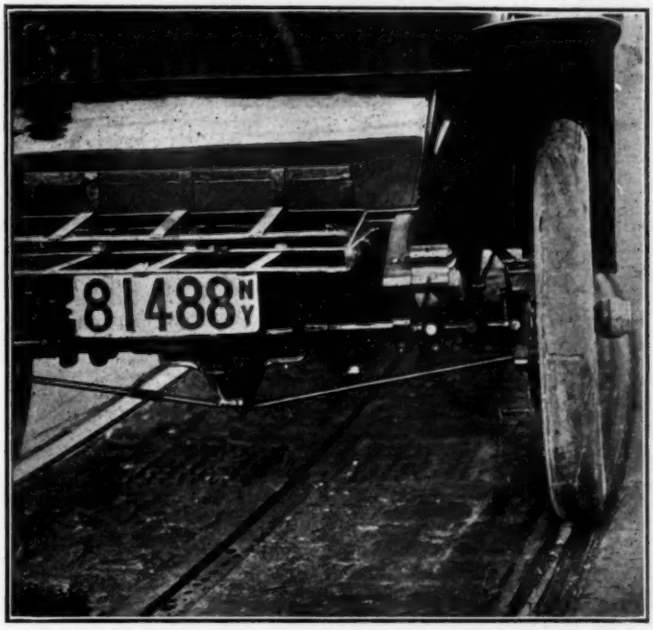


Fig. 7—To damage the tires beyond repair, run in the curve of a car track after it is frayed out, as shown

was accomplished in the manner as shown in Fig. 3, in which a wedge-shaped rock of sufficient height was placed back of the front wheel, and the automobile was then backed off of the rock; it raised up, and the rear axle then cleared the rock. A close examination of the axle indicated that it was not damaged, although the blow was a severe one, and the method is recommended as the very one which is likely to destroy even a good axle, in nine cases out of ten, but an axle of poor construction is bound to be fractured every time.

Just how the automobile looked when the front axle was resting on the rock is possible of discernment by a close examination of Fig. 4, although it proved too dark beneath the car to get a good photograph of the rock and the axle at that point.

The Best Way to Be a Graduate Road Hog

Among the accomplishments of the man who wants to drive wrong must be numbered the one which will enable him to get up a reputation for being what is tersely termed a "road hog." In order to show how it is done, the two automobiles were taken to a road that is narrow, and the one ahead crowded to the left of the road so that the one behind was offered no opportunity of passing excepting on the wrong side. Fig. 5 is a fair illustration of the method, and it is believed that any-

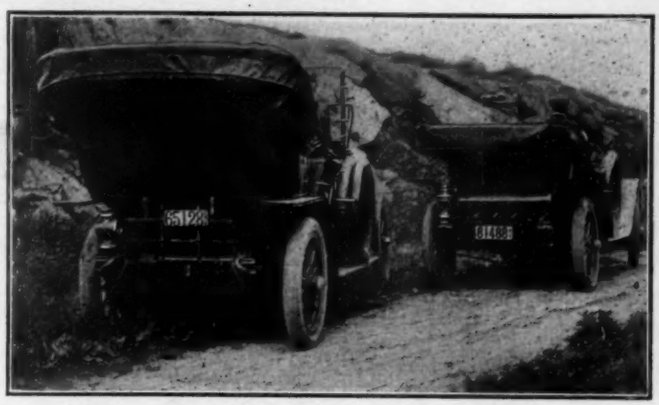


Fig. 5—How a road hog takes to the left of a narrow road to prevent any other autoist from passing him

one, even in the absence of any great skill, will be able to perform the feat at will. All that is required is an automobile and the desire to be mean with a certain studied ingenuity.

How to Damage the Tires With Small Effort

A very good way is to carelessly back up against a formidable obstruction as shown in Fig. 6. Find a narrow roadway, run up it for a distance and then decide to turn around, rather than to see it through. In turning around, throw in the reverse, speed up the engine, then throw in the clutch, and finally back the automobile up against any obstruction that happens to be in the line of travel. Still another good way is to run in the street car tracks just where they are frayed out, as on a curve. Fig. 7 is a good average example.

With the rubber market soaring skyward, and but small chance of a downward trend in the near future at any rate, it is believed that this illustration of the method by which tires may be cut to pieces in a short while should prove of great value to those who prefer to do things the wrong way.

One point, bearing upon the question of destroying tires, was carelessly overlooked. If the tires are more or less flat they will bow to this treatment much better. In order to hasten the destruction of the tires, run them insufficiently inflated. Ordinarily they are inflated (each one the same as the other) to about 80 pounds per square inch, considering the 34-inch sizes (other sizes to correspond), and this full and even inflation protects the tires under the most adverse conditions.

Fig. 6—In backing up, if it is desired to damage the automobile, be careless and back into an obstruction, as shown

Report of Cast Iron Test Bars*

(First Installment)

FOLLOWING closely upon the reading of the paper upon tests of cast-iron bars, many other experimenters presented their results in the same field of endeavor. Thus Prof. W. B. Gregory spoke as follows: The writer has recently made a large number of tests of cast-iron specimens of one-inch square cross section and with supports 12 inches apart, a few being also broken in tension. The results confirm the deductions of the author as to the relationship between breaking loads in tension and in cross bending. The ten-to-one ratio holds in these tests as in those given by the author. Table 1 gives the results of the cross-bending tests, the load being applied at the center.

TABLE 1. TESTS IN CROSS BENDING

Specimens 1 in. by 1 in., 12 in. Between Centers, Load Applied at Center

No.	Breaking Load Lb. per Sq. In.	Deflection In.
1	2,280	0.10
2	2,250	0.10
3	2,680	0.09
4	2,410	0.09
5	2,250	0.08
6	2,370	0.09
7	2,240	0.09
8	2,310	0.08
9	2,250	0.09
10	2,470	0.08
11	2,180	0.10
Mean	2,335	0.09

From the specimens broken in cross bending, six were selected from which were turned tension test pieces approximately one-half inch in diameter at the smallest section, their length over all being five inches. The threads at the ends were three-quarter inch outside diameter. The test pieces were made to fit loosely into the tension bars of the testing machine so that side stresses were entirely eliminated, and the specimens were broken in pure tension. The results are given in Table 2.

TABLE 2. TENSION TESTS

No.	Breaking Load Lb. per Sq. In.
1	22,900
2	23,300
3	22,800
4	23,550
5	24,600
6	22,050
Mean	23,200

The ratio of tensile strength to load in cross bending is

$$\frac{23200}{2335} = 9.94$$

This comparison can be made only on the basis of averages, as no record was kept of the numbers of the specimens broken in cross bending. The six tension specimens therefore represent six of the eleven specimens broken in cross bending. Specimen No. 9 of the cross-bending tests may be taken as fairly typical of the others. A chemical analysis was made of this specimen with the following results:

Total carbon	4.04
Silicon	1.76
Phosphorus	0.562

The mean deflection as given by the author averaged 0.45 inch for two sets of specimens and 0.44 inch for another set. The highest value of deflection in any case was 0.50 inch. Since the deflection varies as the cube of the length of specimens between supports, it follows that the deflection for specimens tested with supports 24 inches apart should be eight times the deflection for a length between supports of 12 inches. On this basis the specimens tested by the writer should have

$$\frac{0.45}{8} = 0.056 \text{ in.}$$

deflection instead of 0.09 inch average as the tests showed. Can this discrepancy be explained by the difference in chemical composition or is it due to other causes?

This raises the question of what deflection ought to be specified for one-inch square specimens with 12 inches between supports. Some specifications have recently been brought to the attention of the writer in which the minimum deflection was placed at 0.15 inch. Is this commercial cast-iron or does it call for a special mixture, expensive and hard to obtain?

The author has mentioned that the "skin of the metal" was of no appreciable thickness. I would like to ask if he has ever tried the effect of rattling on specimens. The process of rattling will remove the sand and the skin of the metal. In this connection the results in Table 3 may be of interest.

TABLE 3. TESTS OF CAST-IRON IN CROSS BENDING

Specimens Round, 1¼ in. in Diameter, 12 in. Between Centers. Not Rattled

No.	Breaking Load Lb.	Deflection In.	Remarks.
1	2,450	0.075	Cast in pairs on end
2	3,010	0.08	" " " " "
3	2,670	0.07	" " " " "
4	2,580	0.14	" " " " "
5	2,700	0.09	" " " " "
6	2,580	0.14	" " " " "
7	2,620	0.08	" " " " "
8	2,430	0.075	Cast flat
9	3,360	0.09	" "
10	2,750	0.08	" "
11	2,990	0.09	" "
12	3,170	0.09	" "
13	2,950	0.095	" "
14	2,960	0.12	" "
15	3,080	0.10	" "
16	2,580	0.075	Cast on end
Mean	2,805	0.093	

The tests given in Table 4 are on specimens of the same size as those in Table 3. The metal used was as nearly the same as the foundry could make it and the specimens were placed in a rattler and the sand and "skin" removed by abrasion. From these figures it will be seen that rattling has increased the strength of the specimens, the increase being 3474 — 2805 = 666 which divided by 2805, gives 23.85 per cent. This phenomenon has been noticed by other experimenters.

TABLE 4

No.	Breaking Load Pounds.	Deflection Inches.
1	3,750	0.09
2	3,330	0.095
3	3,400	0.08
4	3,520	0.09
5	3,640	0.09
6	3,640	0.10
7	2,760	0.075
8	3,670	0.095
9	3,060	0.09
10	4020	0.10
11	3,440	0.09
Mean	3,474	0.0904

The statement that rattling increases the strength by about 25 per cent. seems to be borne out by experiments. The increased strength is probably due to a removal of some of the internal stresses in the specimens and to the fact that the particles of iron, by the process of tumbling the bars together, are allowed to arrange themselves so that they are better able to resist stresses than they were before rattling.

Since the breaking load varies directly as the moment of inertia of the cross section of the specimen about the gravity axis, we have

Ig for the specimens 1¼ in. diameter $= \frac{1}{4}\pi r^4 = 0.7854 \times 0.625^4$
$= 0.12$

*Discussion following the presentation of a paper of this title at the October meeting of the American Society of Mechanical Engineers, Galveston. The discussion is by Prof. W. B. Gregory, the author of the original paper, and others. This paper was designed to show engineers that test pieces, whether cast in separate molds or in the same mold as the main casting, are not perfect indications of the character of the iron in the main casting. In other words, uniformity of results is not found in practice where we know of no reason why they should not be uniform. These test bars were used in the construction of over 3,000,000 pounds of pumping-engine castings, involving soft and hard irons for the various parts.

Ig for the specimens 1 in. square $= 1/12\,bh^3 = 1/12 = 0.0833$
Then

$$\frac{0.1203}{0.0833} = 1.44$$

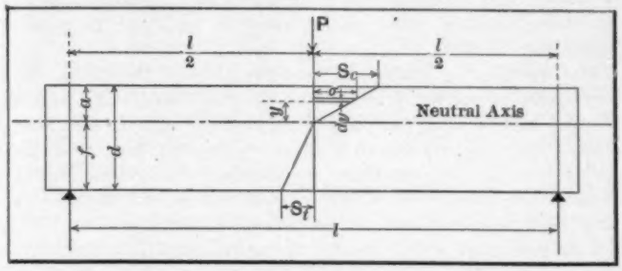
Making the comparison between the unrattled round specimens and the square ones, we have

$$\frac{2805}{2335} = 1.2$$

Comparing the rattled round specimens with the square ones we have

$$\frac{3474}{2335} = 1.487.$$

GEO. M. PEEK. The paper brings up a point which I have had in mind for some time, and which I have never seen explained in any of the text books on the strength of materials or any of the engineer's hand books. The formula is obviously not applicable to cast-iron beams, for the reason that it assumes that the neutral axis of a rectangular beam is in the center, which is true only when the beam is made of a material with equal tensile and compressive strengths.



Sketch of beam to show loading and neutral axis

Automatic Stability in Aeroplanes

(Second and Last Installment)

ADAPTED FROM THE GERMAN BY MARIUS G. KRARUP.

CONSIDERING the gyroscope, if it is forced to take a new angle in spite of its resistance, and this change of angle has to be large, it is liable to follow the lines of smallest resistance, in ways at present difficult to foresee, the difficulty arising largely from burdening it with work too heavy for its capacity in order to avoid a weight which could not easily be carried.

The uncertainties in applying the gyroscope principle are evidently best obviated by reducing the weight of the apparatus to, say, 10 kilos and asking of it a very much reduced amount of work, as may be done on the relay principle by suspending the gyroscope free to turn in relation to the whole machine but capable of actuating the control surfaces by the intermediation of compressed air provided by the power of the motor. In the absence of such feeler-organs as above referred to, it seems unfortunately possible, however, that any operation of the gyroscope may come too late if it can only begin when the machine as a whole has already begun to lose its balance.

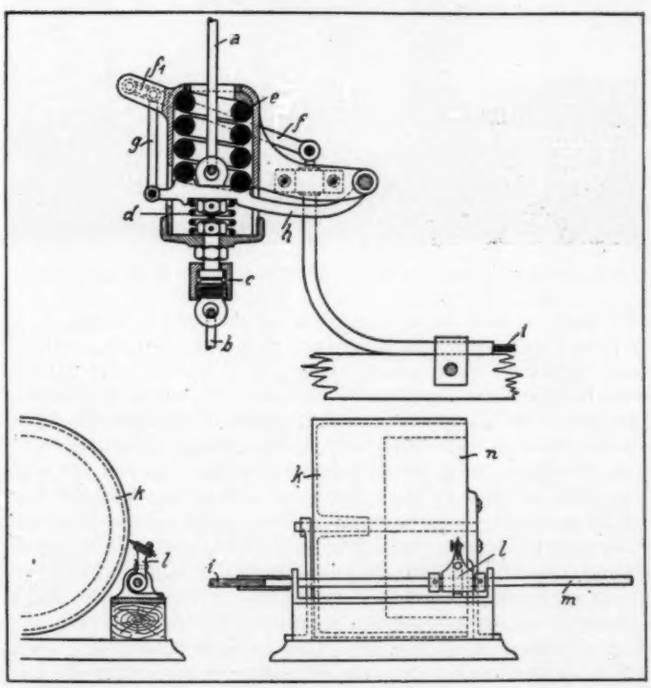


Fig. 2—Dynamometer for measuring stresses in aeroplanes

While this might interfere with the usefulness of the apparatus under an extraordinary combination of unfavorable circumstances, it is equally clear that the device would normally be very useful. The speed of flight is from 20 to 30 meters per second, and if the gyroscope requires only one-third of a second for actuating the control surfaces automatically, danger would in practically all cases be averted, especially if it is assumed that most accidents are due to wrong operation by the aviator and that the gyroscope intelligently applied would not be capable of making mistakes. The experiments made with chrome-nickel steel disks revolved at very high speeds in connection with steam turbines render it certain that the gyroscope can be made to function for a considerable time after the motor has been accidentally stalled, and that it will continue to serve its purpose for safeguarding a landing after such stalling of the motor has occurred.

While the gyroscope is an expensive apparatus, even in the small sizes proposed, it is not generally realized what sums it would save, if it is assumed that it will keep the aviator from committing errors in the control movements at critical moments. The disciples of aviation usually break at least one machine to bits before they learn to operate with safety. Something quite normal is that the learner applies the tilt rudder too strongly, so that the machine suddenly rises in the air, loses its speed and then tumbles down backward. According to the French method of teaching, the learner places his hand upon the arm of the instructor in a number of flights and is expected to await the time patiently when he shall be able to gauge the required control movement instinctively, before a machine is entrusted to him. No doubt, the small gyroscope is capable of obviating the drawbacks in this condition, but it would be advisable to make the most careful experiments before incorporating it in aeroplane construction. It might be taken on board and connected with a registering device, but not with the actual control apparatus, and the latter could be connected with a similar registering device, and the results could be compared. Finally, when it was found that the gyroscope functioned correctly, the control could be entrusted to it. But every automatic balancing device should earn its pilot diploma first.

Automatic stability once secured, most of the other safety measures which have been proposed become superfluous. An auxiliary motor seems an unnecessary complication, whether it

is conceived as an independent prime mover or in some form of stored power operating when required, on the shaft of the main motor. If the brains and energy which would be needed for perfecting arrangements of this order were employed in improvements of details in the present simple construction, with weight added to the motor, if necessary to produce the maximum of reliability, and weight saved at all other points of the structure, wherever possible, there would seem to be more promise of dependable results.

The question is where and how weight can be saved. It is impossible to arrive at an answer to this question by figuring. No one knows what the force of a gust of wind is and how it attacks each part, nor how gradually a landing may be effected under this or that condition of weather and ground surface. It will therefore be necessary to treat the whole machine as a large dynamometer and to undertake experiments for determining just what is the force of the normal and abnormal shocks occurring in the operation of an aeroplane. An apparatus will be required for registering the shocks and stresses graphically, and probably the suspension and guy wires are the parts at which this may be most practically done. The pull on a wire may be measured without a break in the wire (as Mr. Conrad proposes to show on another occasion), but the most convenient arrangement, as sketched in Fig. 2, involves the attachment of the dynamometer between the wire ends *a* and *b*; *g—h—f*$_1$*—f* is a lever transmission which draws the Bowden wire *i* to and fro; *d* is an auxiliary spring, *c* the swiveled connection for wire end *b*. The registering device with drum *K*, clock *n*, pushrod *m* and stylus *l*, are actuated direct from the Bowden wire. More than one stylus might be used, of course.

An apparatus of this order may be placed at any point where it is desired to ascertain the stresses under different conditions of flight, starting and landing, and by continued experimenting on these lines it will be learned where weight may be economized and where strength should be added.

(The translator fears that any stress upon a wire connected as proposed will be immediately transferred to other wires or parts of the structure, as soon as the dynamometer begins to operate, and that the author's idea must be carried out in a different manner.)

To further augment the safety derived from the installation of a small gyroscope acting on the control areas and from improvements in details of construction under guidance of experiments with suitable dynamometers, it would probably be advisable to keep in mind the desirability of a design permitting the aviator to see the ground on which he is to land and over which he must travel for some distance at every start. But the best protection consists, after all, in cultivating that indefatigable habit of inspecting every part of the machine, wire after wire and nut after nut, of which Wilbur Wright has set the example.

The Tails of Aeroplanes Discussed

BY a number of experiments, most of the French and German aviators have satisfied themselves that a trailing tail secures steadiness of flight, and this construction feature has therefore been incorporated in nearly all fliers. Accidents happening to those machines whose tails remain short are pointed to as confirming the general opinion. An example is illustrated herewith, the photo showing the precipitous descent of a monoplane designed and piloted by Robert de Lesseps, one of the sons of the builder of the Suez Canal. Even the German and French Wright biplanes are now provided with caudal appendages, and it is a matter for conjecture whether the Wright biplanes of American manufacture will be similarly equipped or not. The French Wright machine illustrated herewith is not in reality, however, equipped with a tail, as claimed by the advocates of this feature who would fain place the Wrights in the light of imitators. A tilt-rudder has been added in the rear, to be sure, and will serve to steady flight, as the true tails do under average weather conditions, but this tilt-rudder is under control from the driver's seat and thereby obviates the principal objection to tails with immobile horizontal "empennage" or stabilizing planes; namely, that of adding an element which is under control by the wind and not by the aviator and therefore as much a source of danger in sud-

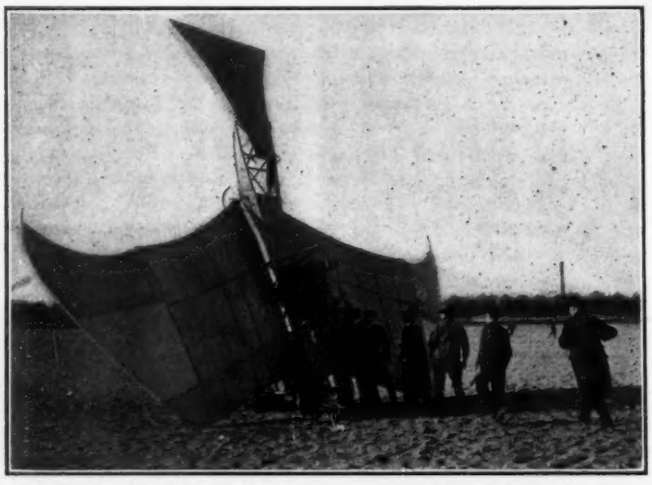


Fig. 1—Precipitation of Robert de Lesseps' Short-Tailed Monoplane

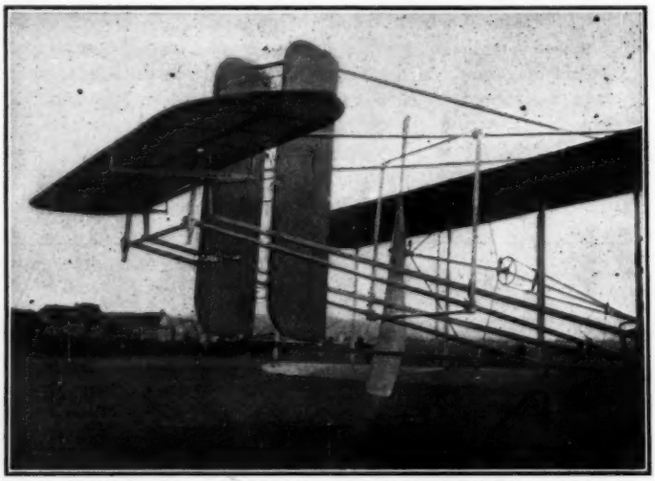


Fig. 2—New Rear Tilt-Rudder of French-built Wright Biplane

den gusts of wind as of comfort when the wind is steady or in a calm. With many aviation meets in progress or in prospect, each subsidized with valuable prizes, it is perhaps only natural that the European designers should adopt the tail as a palliative for shortcomings in the balancing qualities of their machines rather than try to devise a radical remedy, since they will not be required to fly at the meets or for the prizes in the kind of trying weather in which the drawbacks of the long tail and of all other inert wind-catching features in the construction will be put to the test. Appendages, such as that of the new French Wright model, in which the entire surface is under control, belong, of course, in a different class, and it seems likely that a single tilt-rudder in front and another in the rear—where it will also forewarn the aviator of sudden currents from behind—will prove preferable to a double tilt-rudder in front alone, particularly as the two tilt-surfaces may be operated by the same control movement.

The New Motor Vehicle Law of New York

Its Provisions, Operation and Effect

By XENOPHON P. HUDDY, LL.B.

THE LEGISLATURE of the State of New York has enacted a new motor vehicle law and the signature of the Governor, which was affixed to this law on June 2, has finally settled the wrangling which has been going on in this State for a long time between opposing interests concerning automobile legislation. Not since the law of 1904 has the State of New York made any material change in regulating motor vehicles. One or two specific amendments concerning particular subjects have been enacted, such, for example, as allowing surety company's bail bonds to be given. The Legislature has also given a lien to garage-keepers, prohibited chauffeurs from using automobiles without authority and regulated toll for automobiles charged by toll bridges and roads. Aside from these nothing of importance since 1904 has been enacted by the Legislature at Albany except the new motor vehicle law which goes into effect August 1, 1910. This law is comprehensive and attempts to cover the entire subject. It repeals the law of 1904.

It may be said at the outset that the new automobile law is not in any sense a freak measure. On the whole it is a fairly good enactment. There are, however, some objections which may be made to certain of its provisions. It is undoubtedly a revenue measure of the highest type, but automobilists generally do not object to paying large registration fees such as are provided in this law, if the fees are devoted to the public highways. In consideration of the rather high fees—graduated according to horsepower—to be paid for registering automobiles they are exempt from any other tax, either State or local. This is a very wise and fair provision, since if high registration fees are to be paid there should be some compensation for so doing; therefore, automobiles have been relieved from property taxation, but whether this substitute for a property tax is legal is a very serious question. It is equivalent to saying that because automobiles pay a high license fee for using and maintaining certain property, they shall not be subject to ad valorem taxation on that property; or in other words, the license fees are not, in fact or law, license fees, but constitute property taxes.

The law starts out by defining the various terms used therein and the term "motor vehicle" includes all motor vehicles propelled by any power other than muscular, except motor bicycles, motorcycles, traction engines, road rollers, fire wagons and engines, police patrol wagons, ambulances and such vehicles as run only on rails or tracks. It will be seen that motorcycles are not included. They should not be included under an automobile law, and it was a precautionary matter for this law to expressly exclude them, for under the motor vehicle law of Michigan it is held by the Supreme Court of that State that the term motor vehicle includes motor cycles, unless expressly excluded.

Law Defines Chauffeurs and Drivers

The definition of the term "chauffeur" is very short, using less phraseology than the definition in the old law. The present law provides that the term chauffeur shall mean any person operating or driving a motor vehicle as an employee or for hire. This definition is inclusive and exclusive. Any person coming within the definition is a chauffeur. All persons who do not fit the definition are not chauffeurs, and consequently do not have to comply with the provisions of the law concerning employed drivers. I might say that the new law contains a defect which the old law possessed, and which defect is of great seriousness. Under the old law a person who was not a chauffeur and who did not own an automobile, could drive without obtaining a license. For example, a son might use his father's car and drive it all over the State without being compelled to obtain any kind of a license. So might a daughter do this, or any person may borrow or hire a car from another and drive it without being compelled to take out a license. The law has not remedied this situation except in cases where the *exclusive use* of a motor vehicle is given to another for a period greater than 30 days.

The phrase "exclusive use" means uninterrupted use. Therefore, it is nugatory and inoperative in attempting to remedy the defect of the 1904 law. No son or daughter or borrower who uses an automobile belonging to another person has the exclusive use of it for any great length of time. It is an occasional use of a motor vehicle by an unlicensed person which has caused much trouble. Then, again, the exclusive use must be for a period greater than 30 days. It is hard to conceive of a situation where a borrower of an automobile has the exclusive use of the same for a period greater than 30 days. If such a case should be contemplated it would be easy to arrange an interrupted use to get around any question of exclusive use for a period over the limited time. This feature of the new law is objectionable, and there can be no question about it.

Registration by owners of motor vehicles is made with the Secretary of State by filing a verified application containing a brief description of the motor vehicle, the character and amount of the motive power in figures of horsepower in accordance with the rating established by the Association of Licensed Automobile Manufacturers, the name and address and business address of the owner, and if the motor vehicle is to be used solely for commercial purposes the application shall so certify. It should be noted that the only qualification an owner must possess is age of at least 18 years.

The horsepower is to be calculated according to the rating established by the Association of Licensed Automobile Manufacturers. Evidently this law assumes that every one will take judicial notice of what the Association of Licensed Automobile Manufacturers is, and its formula for rating automobiles according to horsepower. Although the provision in regard to determining the horsepower may be perfectly valid, my opinion is it would have been in better taste if the formula adopted by the Association had been inserted instead of using the name of the Association of Licensed Automobile Manufacturers. This criticism may perhaps be more fanciful than real.

The fees to be paid for registering vehicles are: $5 for a motor vehicle of 25 horsepower or less; $10 for more than 25 horsepower and less than 35 horsepower; $15 for 35 horsepower and less than 50 horsepower; $25 for 50 horsepower and more; but when an automobile has been licensed under this law for a period of four separate years the annual registration fee thereafter is one-half of the amount. This does not apply to motor vehicles used solely for commercial purposes, the fee for which is $5 annually.

The owner of a motor vehicle used for pleasure is compelled to pay very much more for his pleasure than the proprietor of a commercial motor vehicle pays for registering the means which he places upon the streets for profit. It would seem that there should be no distinction between these two classes of motor vehicles in favor of commercial cars, and if any distinction is made it should be made in favor of the pleasure car, since an instrument which is earning money and represents an investment producing dividends should pay for its existence.

On the Sale and Transfer of Automobiles

When an automobile is sold, the vendor must under the law give notice of the sale, with the name and address of the vendee, to the Secretary of State, and the vendee shall within 10

days notify the Secretary of State of the sale by filing a verified statement with the Secretary of State. The vendee must pay a fee of $1, upon receipt of which the Secretary of State will note the change of ownership. Upon the sale of a motor vehicle by a manufacturer or dealer, the vendee is allowed to operate the same for a period of 15 days after taking possession, until he has received his certificate of registration and number plates from the Secretary of State, but the motor vehicle must carry a placard bearing the registration number of the dealer or manufacturer. Application for registration must be made before the motor vehicle is used.

Provision is made for the registration of motor vehicles by manufacturers or dealers. The act reads that manufacturers and dealers *may* obtain a general license. The registration fee is $15. Duplicate number plates for manufacturers and dealers may be obtained from the Secretary of State upon the payment of $1 for each duplicate.

Non-resident owners are exempt from registering in the State of New York if they have duly complied with the laws of their home State and carry their home State credentials, provided their home State grants substantially the same exemption to residents of New York, but foreign corporations are not exempt.

This provision demanding the exemption by other States will have a most salutary effect upon New Jersey, where a special license must be obtained now for non-residents to enter that State. New York has always exempted non-residents, and the residents of New Jersey have always had the privilege of entering New York without obtaining any additional license. After the 1st of August residents of New Jersey will not be exempt in the State of New York.

The law provides that motor vehicles shall be equipped with adequate brakes, bell, horn or other device for signaling, and two lights on the front at night and one on the rear, displaying a red light visible from the rear. Two number plates must be carried, one forward and one on the rear. These will be furnished by the State, and the color will be changed annually.

Most important of all the provisions of the new law is that concerning speed. It is as follows:

"Every person operating a motor vehicle on the public highway of this State shall drive the same in a careful and prudent manner and at a rate of speed so as not to endanger the property of another or the life or limb of any person; provided, that a rate of speed in excess of thirty miles an hour for a distance of one-fourth of a mile shall be presumptive evidence of driving at a rate which is not careful and prudent."

The above speed provision, in the first place, will make it more difficult to convict automobile drivers of exceeding the speed limit, since exceeding 30 miles per hour for a distance of one-fourth of a mile is merely presumptive evidence of unlawful driving. An automobilist will be allowed to introduce evidence in defense to the effect that he was endangering no person or property, and if his speed was 50 or 60 miles an hour he cannot be convicted. It also should be borne in mind that a speed in excess of 30 miles must be maintained *for at least one-fourth of a mile*. No more will officers be permitted to catch automobilists on technical violations of the law for a distance of one or two blocks. When the automobile driver is caught it will be up to the police to prove their case, and it will be necessary to show, not only the excess of speed for a distance of at least one-fourth of a mile, but the prosecution must be prepared to show that there was danger created. Suppose no person was on the highway when an excessive speed was maintained. In the case of a chauffeur he might be found guilty because it might be said that he was endangering the automobile, the property of another. Whether a person driving an automobile could be convicted because he was endangering his own life and limb is a serious question, but it is possible that such a conviction would be legal.

Another question arises, and that is whether the excessive rate must be continuous for a distance of at least one-fourth of a mile. I believe it must be. If a driver slows down anywhere along the quarter-mile course to a rate less than 30 miles an hour, he cannot be convicted. Evidence introduced upon the part of the prosecution that the rate exceeded 30 miles an hour, which creates a presumption of imprudent driving, would not be sufficient to convict a driver since there is a presumption of innocence, and one presumption would merely balance the other. It is the duty of the State to prove its case beyond a reasonable doubt.

Power of Local Authorities Is Fixed

Local authorities, such as cities and other municipalities, may not impose any further tax or license on chauffeurs or exclude chauffeurs from the free use of the public highways, except where certain roads are set apart for horses, nor may local authorities in any way, respecting motor vehicles or their speed upon the public highways, pass or enforce any ordinance. There is a joker here in the law which will be pointed out presently. But municipal authorities may regulate automobiles offered to the public for hire. A certain highway may be set aside for speed contests under proper restrictions. Local authorities may also exclude motor vehicles from cemeteries and may also exclude commercial motor vehicles from parks, where the same reason exists for excluding other commercial vehicles.

The new law provides that it shall not impair the validity of any local regulation concerning the speed of motor vehicles made or hereafter to be made, which regulation would be authorized by law in any city of the first class. This is a rather peculiar provision. It does not authorize cities of the first class to regulate the speed of motor vehicles or to do anything else, and if such cities desire to regulate speed, they must find express authority from some other source. The new law is merely passive, and states that it will not itself invalidate any such regulations, but there may be other vitiating causes. This provision of the bill is certainly a joker, and the wonder is that it ever passed Governor Hughes, considering the stand he has taken in regard to according to the large cities power to regulate travel.

The local authorities of other cities and incorporated villages may limit the speed of motor vehicles, provided the rate is not less than a mile in 4 minutes. The maintenance of a greater rate of speed for one-eighth of a mile shall be presumptive evidence of unlawful driving. What was said previously in regard to the 30 miles limit may be said with equal reason to the *prima facie* speed clause here, but in order for a municipality or incorporated village to prescribe a lower rate of speed, signs must be posted, and the regulations must fix the punishment. Official copies of the ordinances must be filed with the Secretary of State 30 days before they take effect.

Chauffeurs must obtain an annual license, and are required to pay an annual fee of $5. The Secretary of State is to appoint examiners, who are to hold examinations at convenient places throughout the State. Chauffeurs must send a photograph with their applications, and the photograph must be taken at least 30 days prior to the filing of the application. The examination shall cover such questions concerning qualifications as the Secretary of State shall require. No chauffeur's license shall be issued to any person under 18 years of age. A chauffeur's badge is furnished and must be worn in a conspicuous place.

Registrations Expire on a Definite Date

All registrations of every character expire on January 31, 1911, and the fees up until that time are one-half of the annual fees provided in the law. Thereafter registrations expire annually.

For violating the speed law the maximum penalty of $100 is provided, and that is all. It is a misdemeanor to operate an automobile when intoxicated, and to run away after an ac-

cident and to refuse to stop and give the name and address of the operator is a felony, entailing severe punishment.

It is provided that a third or subsequent conviction of a chauffeur for violating the speed law, upon recommendation of the court, the Secretary of State shall forthwith revoke his license. This same punishment does not obtain in the case of any other person operating a motor vehicle.

The age limit for all operators, whether owners, operators, hirers or chauffeurs, is 18. Therefore, an owner may not register his automobile and receive a license to run it if he is under that age, but he can register the machine and employ a chauffeur to operate it, or allow an unlicensed stranger to use it.

The law goes into effect August 1, 1910, according to its expressed provisions, but it is enacted that applications for registration may be made, examinations held and number plates, license and badges issued at any time within 90 days prior to the time of the taking effect of the law. It is a serious question whether or not the whole law is valid, since it provides that it is to go into effect August 1st, and also gives 90 days in which those covered by the law may prepare themselves to comply with it. The Governor signed the law on June 2d, and there are not 90 days between that time and the first of August. That part of the law which allowed this 90 days is just as important as that part which says it shall go into effect August 1st, and if one is inconsistent with the other, it is very doubtful whether the law can go into effect August 1st, and if it cannot go into effect on that date there is no authority to put it into effect thereafter on any subsequent date.

No Autos in Roosevelt Parade

When Colonel Roosevelt comes home there will be no automobiles in line to receive him. At least there will be none in the parade, which will be an important part of the reception plans, according to a letter addressed by the secretary of Justice Gerard, who is in charge of the Reception Committee, to James M. Carples, representing the Licensed Automobile Dealers' Association.

Mr. Carples, on behalf of the association, had tendered some cars to the committee, and the following reply was received from the judge:

"Mr. Justice Gerard directs me to acknowledge receipt of your letter of May 11 in regard to your very patriotic offer of 60 automobiles for the reception of Colonel Roosevelt, and to express through the judge the appreciation of the entire Reception Committee for your most generous offer.

"I am very sorry to say that the committee in charge of the Roosevelt reception find that they will not be able to accept the use of these autos. Major-General Roe, in charge of the parade, does not think the automobile can go slow enough, and as he is in charge, the committee bows to his wishes to use carriages instead of automobiles.

"Assuring you of the appreciation of the Reception Committee, and regretting that the offer cannot be accepted, I am, respectfully yours,

"(Signed) JOHN J. MURPHY,
"Secretary to the Justice."

Coming Events in the Automobiling World

June 20-July 6....Detroit, Mich., Industrial Exposition, Detroit Board of Commerce.
Dec. 1.....Chicago, Ill., First Annual Aeronautical Exhibition in the Coliseum.
Jan. 7-14, 1911...New York City, Madison Square Garden, Eleventh Annual Show, Pleasure Car Division, Association of Licensed Automobile Manufacturers.
Jan. 17-24, 1911..New York City, Madison Square Garden, Eleventh Annual Show, Commercial Division, A. L. A. M.
Feb. 13-25, 1911..Chicago Coliseum, Tenth Annual National Automobile Show, N. A. A. M.

Races, Hill-Climbs, Etc.

June 6-14.....Atlanta, Ga., Reliability Run to New York City. New York Herald and Atlanta Journal.
June 7-11.....Carolina Endurance Run.
June 10-11.....Fort Erie, Ont., Track Race Meet under management of Buffalo interests.
June 11.....Newark, N. J., Reliability Run, New Jersey Auto & Motor Club.
June 11.....Portland, Ore., Road-Races of Portland A. C.
June 11.....Wilkes-Barre, Pa., Annual Hill-Climb up Giants' Despair, Wilkes-Barre Automobile Club.
June 14-15.....New York, Reliability Run of Motor Contest Association.
June 14-30.....Cincinnati, Seventh Annual National Reliability Run for Glidden Trophy, Through the Southwest.
June 16-22.....Albany Automobile Club, Albany, N. Y., Sixth Annual Tour to Atlantic City and Return.
June 18.....Ossining, N. Y., Hill Climb of Upper Westchester Automobile Club.
June 18.....Baltimore Hill-Climb of Automobile Club of Maryland.
June 18.....Philadelphia, Race Meet, Quaker City Motor Club.
June 25.....Port Jefferson, Long Island, N. Y., Hill-Climbing Contest. Automobile Club of Port Jefferson.
June 25-26.....Roadability Run, Automobile Club of Philadelphia, to Lake Hopatcong, N. Y.
July 1-4.....Indianapolis, Ind., Track Meet. Cobe Trophy Race—Held on Speedway Track, Chicago Automobile Club.
July 1-10.....Los Angeles, Cal., Road Carnival of Licensed Dealers.
July 2-4.....Los Angeles, Cal., Speedway Meet.
July 2-4.....Wildwood, N. J., North Wildwood Automobile Club, Speedway Races and Club Run.
July 4.....Auburn, N. Y., Hill Climb of Automobile Club of Auburn.
July 4.....Cheyenne, Wyo., Track Meet of Cheyenne Motor Club.
July 4.....Dallas, Tex., Track Meet of Dallas A. C.
July 4.....St. Paul, Track Meet of Minnesota State Automobile Association.
July 11.....Plainfield, N. J., Hill Climb of Plainfield Automobile Club.
July, Middle of...Richfield Springs, N. Y., Hill Climb.
July, Middle of...Grand Rapids, Mich., Road Race of Grand Rapids Automobile Club.
July 18-23.....Milwaukee, Wis., Tour of Wisconsin State Automobile Association for Milwaukee Sentinel Trophy.
July 30.....Wildwood, N. J., North Wildwood Automobile Club, Speedway Races and Club Run.
Aug. 1.....Minneapolis, Minn., Reliability Run of Minneapolis Automobile Club.
Aug. 3-5.....Galveston, Tex., Beach Races, Galveston Automobile Club.
Aug. 4.....Algonquin, Ill., Annual Hill Climb of Chicago Motor Club.
Aug. 15.....Start of Munsey Tour.
Aug. 17.....Cheyenne, Wyo., Track Meet.
Aug. 31.....Minnesota State Automobile Association's Reliability Run.
Sept. 2-5.....Indianapolis, Ind., Speedway Meet.
Sept. 3-5.....Wildwood, N. J., Reliability Run and Speedway Labor Day Race Meet of North Wildwood Automobile Club.
Sept. 5.....Wildwood, N. J., Track Meet.
Sept. 5.....Cheyenne, Wyo., Track Meet.
Sept. 5.....Denver, Col., Road Race, Denver Motor Club.
Sept. 5.....Los Angeles, Cal., Speedway Meet.
Sept. 5-10.....Minneapolis, Minn., Track Meet at State Fair.
Sept. 9-10.....Providence, R. I., Track Meet.
Sept. 10.....Los Angeles, Cal., Mount Baldy Road Race.
Sept. 10-12.....Seattle Wash., Race Meet.
Sept. 17.....Syracuse, N. Y., Track Meet of Automobile Club of Syracuse, Syracuse Automobile Dealers' Association and the New York State Fair Association.
Sept.....Chicago, Commercial Car Reliability Contest of Chicago Automobile Club.
Oct. 1.....Long Island Motor Parkway, Vanderbilt Cup Race, Wheatley and Massapequa Sweepstakes.
Oct. 3.....Louisville, Ky., Reliability Run, Louisville Automobile Club.
Oct. 6-8.....Santa Anna, Cal., Track Meet.
Oct. 7-8.....Los Angeles, Cal., Speedway Meet.
Oct. 8.....Philadelphia, Fairmount Park Race, Quaker City Motor Club.
Oct. 15.....Long Island Motor Parkway, Grand Prize, Automobile Club of America.
Oct. 15-18.....Chicago, Ill., Chicago Motor Club's 1,000-Mile Reliability Run.
Oct. 20-22.....Atlanta, Ga., Speedway Meet.
Oct. 23.....San Francisco, Cal., Road Race, Portola Cup.
Oct. 27-29.....Dallas, Tex., Track Meet.
Nov. 5-6.....New Orleans, La., Track Meet.
Nov. 6-9-13.....San Antonio, Tex., Track Meet.

Foreign Shows and Races.

May 1-Oct. 1.....Vienna, Austria-Hungary, Automobile and Aviation Exposition.
May 28-June 9...St. Petersburg, Russia, Automobile Exposition.
June 13-18.....Scotland, Scottish Reliability Trials.
June 20.....French Voiturette Race.
June 21.....French Stock-Car Race.
June 22-July 5....Russian Touring Competition, St. Petersburg to Moscow; also Commercial Vehicle Trials.
June 27.....Speed Trials at Kiev, Russia.
Aug. 1-Sept. 15...French Industrial Vehicle Trials.
Oct. 15-Nov. 2....Paris, France, Aeronautical Society Show.

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THERE never was a time when the farmers could do without roads, and that they exhibit rare patience with the kind which are designated as bad, is true; but the day naturally comes when patience ceases to be a virtue, and it is apparently in evidence that the farmer is awakening to his opportunity now that the automobile is backing him up; it is a common cause. That the farmer is merely satisfied to have the assistance of the automobile maker in his fight for good roads is scarcely up to the level of belief; there is no better customer of the industry than the farmer, and that he is showing his customary good judgment is proven by the character of the automobile he selects for his own work.

The "Good Roads Tour," which is now winding its strenuous way between Atlanta and New York, is the handiwork of citizens of breadth, and a debt of gratitude is the proper due to the New York *Herald* and the Atlanta *Journal* for the excellence of the work undertaken; it represents valuable time, enterprise, administrative capacity, and liberality of policy. That this tour is needed as a missionary effort in favor of better communication is evinced by the illustrations of the roads in the South as they are depicted in THE AUTOMOBILE this week. It is these roads that the tourists will have to travel over, and while it is true that there are many stretches of fine macadam roadway in the South, even so, the illustrations talk for themselves. The impression they give is one that is known to every farmer. The roads are not nearly as good as they ought to be—they cannot be too good.

IT looks like a consignment of impertinence to take pains, and to incur a measure of cost, for the avowed purpose of teaching a novice how not to drive an automobile. On second thought there may be some virtue in this plan; it may bring a novice to a more complete realization of the fact that he should fight off his natural inclination on the ground that the natural way seems to be the wrong one. Philosophers have never taken the trouble to state why weeds grow in a garden without any cultivation at all, or why men have to learn to do the right thing in every walk in life. Perhaps it is for the same reason that the natural product of the soil is weeds. The act which is performed as a matter of habit requires no premeditation, and as difficult as it may be to point out the right way, it is a matter of small moment compared with the amount of effort which is demanded to awaken a victim from the force of his habit.

In view of a natural bent, considering well the tenacity with which the fangs of habit fasten to the thinking apparatus of man, it is not too much to say that there is a measure of reason in the process which has for its basis the awakening of the sense to the habitual wrong. It is a common saying that one cannot do two things at one time; if this is so, one is debarred from doing right during the period of following a natural bent in the wrong direction. With this underlying basis, it does not seem a far-fetched undertaking to more or less tersely point out how ruin can stare an autoist in the face; were he conscious it would scarcely be necessary to go to the pains; perhaps this process will awaken him.

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LUBRICATION has more to do with success in the maintenance of an automobile than the average man is likely to realize, and in view of its dual angle, there is an excellent chance for confusion of mind in dealing with this problem. One not accustomed to the situation might readily be led to the conclusion that quality of the lubricant is about all that has to be taken into account. All the lubricating oil on this mundane sphere would be as pearls to swine in the face of an ill-contrived mechanism placed for the purpose of feeding the lubricating oil to the zones which work under pressure, offer a hiding-place for the silt of the road, and squeak for want of a slippery surface when the oil fails to arrive on time.

In addition to the requisite quantity of a suitable grade of lubricating oil there must be an efficient conduit which will lead the oil from its storage tank to the surfaces which work under pressure and which have to be not only lubricated, but sealed so that dirt may not get in. Profuse lubrication accomplishes these ends, and the probabilities are that pressure is necessary if the work is to be well done. Just now this question of feeding lubricating oil under pressure is being agitated in the haunts of the automobile engineer, and there seems to be a decided tendency in favor of a definite means by which oil under a controlled pressure will be forced to travel from its lodging-place in a storage tank to the wearing surfaces which are so prone to manufacture food for serious reflection, if there is any uncertainty involved. Next to a suitable contrivance comes the quality of the lubricating oil; there is no need to state that it ought to be almost superlative, but there is occasion for saying that fraudulent substitutions should be carefully avoided.

Editorial High Lights Casting Reflections

WHEN an exhaust valve refuses to stay tight, the conventional recommendation is "grind it in"; but when an autoist follows this liberally provided free advice until he gets wearied of grinding, he begins to wonder if he is not really barking up the wrong tree. The chances are that it would be more to the point to ascertain why the valve fails to stay ground in for a reasonable length of time. If the valve stem is but poorly related to the head, which will be true if the fillet which joins them is considerably restricted, what the autoist needs is a new and properly fashioned valve; but if the water jacket, which is supposed to maintain an even temperature all around the seat, is stopped off by core sand in the foundry, what the autoist requires is a new cylinder. Valve grinding is an occasional process with a good automobile motor, but it is a continual nuisance with the other kind.

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Noise is said to be the most annoying part of an automobile; it creeps in at the invitation of age but slowly in a well-made car; but it has the unhappy knack of starting to wear out its welcome much too soon in the other kind. The man of experience defers the evil day and puts money in his pocket at a single stroke. His receipt is very simple; it calls for a liberal supply of good lubricating oil. When a car reaches the point in its life where noise becomes unbearable to the autoist of some discrimination, if the economy bug has a speaking acquaintance with him he will most likely make the mistake of commissioning a repair man to take the noise out of the automobile. When his money takes wings and he finds himself alone with the repairman's ideas annexed to a worn-out car, he will most likely make the sad discovery that noise is not eliminated by tacked-on innovations, although the chances of having additional trouble to cope with may have increased. The whole situation is portrayed in the simple statement, i. e., the prospect of parting with good money overcomes judgment, and blinds the victim to the unalterable fact he would never be able to induce himself, even by a money argument, to put up with an ill-behaved, noisy automobile, nor is it likely that a repairman, even of some ambition, will be able to silence the crokings of a worn-out car—the right solution will be found in a new automobile.

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We hear so much about explosion in connection with the automobile motor as explosion stroke, explosion due to ignition, explosion pressure, and like expressions, which, when properly analyzed, are cast out as failing to represent anything in accord with the facts, that it is not to be wondered at if autoists at large are imbued with the idea that gasoline is an explosive and will explode. It will be safe to conclude that nitro-glycerine is an explosive, but no amount of research will permit one to arrive at the conclusion that the relation of gasoline to nitro-glycerine is any nearer than that of a jungle tiger to an inoffensive Mexican burro. Nitro-glycerine is an explosive because it holds a large amount of energy per pound, and for the further reason that it evolves, in the process of burning, all the elements which are necessary for its complete combustion. Gasoline does not contain sufficient oxygen, either free or combined, to complete combustion; if it burns at all it must be supplied with oxygen sufficient for the purpose, and this oxygen must come from some other source. It is free in the air, and it is accepted therefrom when in the natural course the gasoline is utilized for its intended purpose. Under the circumstances, and in view of the controlling facts, the embryo autoist, whose fears are prone to overcome him, may accept gasoline as a fuel to be handled with impunity, unless he mixes it with a sufficient quantity of oxygen to produce carbonic acid and water, and applies a flame to start the fire. The word "explosion," in connection with gasoline, is nothing but a figure of speech.

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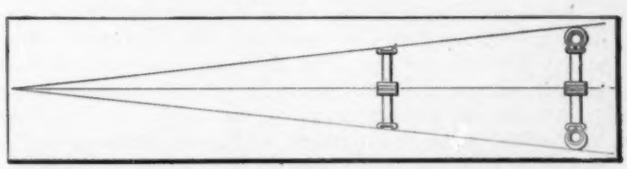
"Sea Island Cotton," as a statement, possesses a certain picturesqueness of language which carries conviction, particularly when this fixed phrase is used in describing pneumatic tires. Its companion, "Para Rubber," has also a certain elevating sound, and it would be interesting to know to what extent Sea Island cotton and Para rubber are actually used in the building of pneumatic tires. It is understood that Sea Island cotton seed is used for the production of a certain high grade of cotton, and some of the German weavers of fabric use it in the production of the character of fabric which serves for automobile tire work. Departing from this phase of the problem for the time being, a certain curiosity leads one astray far enough to ask the average autoist if he thinks even Sea Island cotton fabric will stand up if the tires are run flat. Even if the tires are inflated, it does not necessarily follow that they are all so "blown up" that the diameters of the four wheels will be the same. A child would know that a cone-shaped spool, instead of rolling straight ahead, will describe a circular arc. If the tires on the four wheels are not blown up so as to result in equal diameter of all the wheels, they, too, will describe a circular arc in so far as their relation to the chassis will permit, and even if they are restrained, there will be sufficient disalignment to enormously reduce the life of the tires. To the man who wants to reduce the cost of tire maintenance it will be in the path of wisdom to stop dreaming about Sea Island cotton and Para rubber and go to work. The task which will have to be performed is represented in the simple process of inflating all of the tires so that they will sustain the weight to be borne, and making sure that the wheels be of one diameter.



Depicting the conical effect when one tire is well inflated and the other is more or less flat or removed from the rim

A Quiet Week in Detroit—A.L.A.M. Stirs Pudding

Abbott Claims Conspiracy to Stifle Trade

DETROIT, June 3—In the answer filed in the suit of the Columbia Motor Car Company, acting for the A. L. A. M., against the Abbott Motor Company, of this city, the latter company acting through its attorneys, Abbott & Abbott, Majestic Building, and associate counsel Offield, Towle, Graves & Offield, claims conspiracy to stifle competition, limit manufacture and sale of automobiles, and enhance profits of manufacturers operating under the Selden patent. This answer was filed yesterday by the Abbott company's attorneys and created quite a sensation.

More than this, the Abbott company claims that its own agents have been interfered with, and greatly hampered in making sales. The company asserts that the Selden patent has less than two and a half years to run and alleges: "That manifestly it is the intention and policy of the Columbia Motor Car Company and the Association of Licensed Automobile Manufacturers, who own and control its product, to bring suit under the patent and harass competitive manufacturers, compelling them to expend large sums of money in the courts."

Further, the company alleges that it is not the purpose of the complainant to bring these cases to trial, and petitions the court that the case be ordered to an immediate issue; also, that the complainant and the A. L. A. M. be restrained from threatening the Abbott company or its customers with further suits under the Selden patent, from in any manner hereafter interfering with agents or employees of the Abbott company, and from interfering with the credit of the Abbott company by letters, threats, etc.

A new point is made when the Abbott company asserts that the principal features of the Selden patent were disclosed in printed publications in this and foreign countries two years previous to the date of application for the Selden patent, and that the essential points thus became publicly known and were publicly used two years before the patent was asked for.

It denies the right of the company to bring suit against the Abbott company, charges Selden with postponing the issue of his patent for the "fraudulent purpose of extending the life of the letters when granted," and charges that he copied the ideas of other inventors. Further, it is claimed that the complainant company has no right to determine who shall have licenses under the patent, and charges that a large part of the fees received from such licenses are retained and used for the purpose of maintaining various committees known as: Price Committee, Trades Committee, Agency Control Committee, Association Patents Committee. The duties of these committees, the Abbott company claims, "consist solely in making arrangements and understandings whereby commerce between the various States and Territories and foreign nations in said automobile industry is sought to be controlled."

The answer was filed in the United States Circuit Court here yesterday.

News-Hunter Brings Down a Bag Full

Despite an unusually quiet week in Detroit, due, perhaps, to the long-continued bad weather, there was something going on during each and every one of the seven days just past. The biggest news items included the details of three new plants, one of them a mammoth steel plant, which would be of vast assistance to the industry as a whole. This was somewhat in the nature of a rumor, although well-known Chicago capitalists and steel men visited the city, inspected sites, and saw many local capitalists and business men. The men were A. W. Thomson and J. W. Alvord, both directors of the Inland Steel Company. While here they were entertained by Thomas H. Simpson, of the Michigan Malleable Iron Company, and George H. Barbour, of the Michigan Stove Works. Following closely upon their visit and the attending rumors, the Common Council took action with regard to the vacating of certain streets between Jefferson avenue West and the river, which makes it possible to have a clear tract of land there of between 14 and 18 acres, which can be increased to 20 acres by filling in to the river bank. The steel plant as projected was connected up to this city action. The location is an ideal one, near to the Detroit Iron & Steel Company's plant, while the Detroit Furnace Company is said to be seeking land in the vicinity. The Morgan & Wright factory is close by. Later, this rumor was denied, it being reported that the land in question was under option to Rogers, Brown & Company, who would erect an iron furnace. Either way, Detroit and the automobile industry will be the gainer.

The newly organized Grant & Wood Mfg. Co., of Detroit and Chelsea, in which A. O. Smith, of the A. O. Smith Company, of Milwaukee, Dr. J. B. Book, formerly of the E-M-F Company, Walter E. Flanders, president of the E-M-F Company, and others, are interested, announced the past week that they would embark in the manufacture of steel balls, in addition to the line of machine tools previously announced. This leads the company directly into the ball bearing business, bringing them into direct competition with other American bearing companies. With the strong E-M-F interests in the company, this move is taken to mean that the E-M-F cars for next year will be outfitted with the new ball bearings.

The two automobile plants to be announced will not be located in Detroit proper, one being for Port Huron and the other for Alpena. The latter city has accepted the proposition of C. H. Nunnelly and H. V. Grosbeck, of Mt. Clemens, and will furnish $20,000 in stock, a site, and a cash bonus of $50,000, while the promoters are to furnish $30,000. The car which will be built is to have a four-cylinder engine rated at 35 horsepower, runabout and similar bodies of three- or four-passenger capacity, and sell for $1,600.

Cass Motor Truck Locates at Port Huron

Out at Port Huron, the selected location of the Cass Motor Truck factory was announced. It is to be upon Lapeer avenue, and work has been started upon it. The company expects to give employment to 600 men at the start. The following directors have been selected for the company: John O. Turnbull, George Epstean, Frank B. Nichol and A. N. Spater, of Detroit; H. G. Barnum, Philip Higer and F. J. Haynes, of Port Huron.

Saginaw will be the scene of the next big operation of the General Motors Company, which has just announced that the sum of $800,000 will be spent upon the Jackson-Church-Wilcox plant there, where all General Motors steering gears are now being built. Some wonderment has been expressed at the action of Russell C. Durant, son of W. C. Durant, head of the General Motors Company, formerly Pacific Coast representative of the Anhut Motor Car Company, in suing that company for $5,000. This action was taken directly after a visit to his father to Flint. Young Durant claims that the $5,000 represents deposits on cars which were not delivered to him, and money spent in advertising. Being under age, Durant had to bring suit through a friend.

During the week, the Detroit-Dearborn Motor Car Company filed notice with the Secretary of State of an increase in its capitalization from $100,000 to $250,000.

A stockholders' meeting for June 15, in Jersey City, N. J., has been called by the United States Motor Company, to consider the advisability of increasing the capital stock from $8,000,000 common and preferred to $15,000,000 of each, making a total of $30,000,000. The common stock will be placed on a six per

cent basis, July 1. As the fifth member of the executive committee, of the Detroit division of the United States Motor Company, John A. Boyle, general manager of the Briscoe Mfg. Co., has been selected. He has been connected with the Briscoe company since its formation, being one of Detroit's old hardware men. The other members of the executive committee are: Frank Briscoe, chairman; O. J. Mulford, vice-chairman; E. J. Corbett and Morris Grabowsky. E. B. Martin is secretary for the committee.

Operators of automobiles for hire will not have such a cinch in the future as they have had in the past, according to a new ordinance, which the Corporation Counsel has been directed to draw up and which is nearly ready for action. When the taxicab regulation was drawn up, it was so worded as to apply only to automobiles equipped with a taximeter. This, coupled with some ambiguity in the wording, has allowed drivers of automobiles not fitted out with a taximeter to charge any fare they pleased, which they promptly did. The new ordinance is intended to remedy this defect.

The nearness of the State Fair, and the amount of advertising being given to it, in the way of advertising that the first showing of the 1911 models of automobiles will be made there, has done much toward booming the coming Industrial Exposition, to be held here June 20 to July 6, in which the automobile manufacturers and dealers have promised to participate. The latter are vitally interested, for the great influx of out-of-town visitors, particularly from the smaller towns, where agencies are not maintained, at this very seasonable time of the year, is expected to result in much business. The lighting plans for the exposition have been approved and the work is going on apace. It is intended to make this one of the big features of the show.

Owners of property along the Boulevard, Detroit's finest thoroughfare, have combined and formed an association, the object of which is to fight the further encroachment of garages, factories or unsightly driveways, which would make the drive as a whole less beautiful. The name of the association is the Boulevard Improvement Association, and they have already scored a signal victory in having the Common Council refuse permission for the building of several driveways, asked for by the Ford Motor Company, which is building an immense garage and salesroom on one of the prominent Boulevard corners. In this connection, it is said that the Packard Company is soon to follow in Ford's footsteps, the purchase of a large corner by Henry B. Joy being said to have this significance.

Dealers' Association Had a Beefsteak Dinner

Members of the Detroit Automobile Dealers' Association, more familiarly called DADA, were entertained at a beefsteak dinner by the Tivoli Brewing Company, at which it is said the refreshments partook more of a liquid nature than of solid.

Among those to join the colony across the river in their bid for Canadian business is the McCord Mfg. Co., which has just begun manufacturing operations in the new branch at Walkerville. A force of 60 men started work.

On Monday, a stock Flanders 20 roadster started from the factory for Quebec, there to start on a long trip to the City of Mexico. The intention is to show the ability of the little car to stand up nder any road conditions met with in the three countries, for which reason the tour has been named the "Under Three Flags Reliability." In the car are W. H. Lane, of the factory, as driver and pilot, and Paul H. Bruske, the new contest manager.

A very clever idea in the way of stopping speeding of automobiles in the State of Michigan has been evolved by the Secretary of State, who has sent out blanks to all townships and cities of the State, with a request that the names, addresses and other details of all persons who, within the past year, have been arrested for speed violations. It is the intention to compile this into a State blacklist, and have a copy on file in every city and township, so that as soon as a person is arrested for speeding, it will be possible to ascertain if he has ever been arrested for the same offense, and the details of the previous case. By keeping this record and list up to date, it is thought that justices will be able to inflict the proper fines, considering the previous record of the offender, and in this way reduce the amount of speeding.

Considerable dissatisfaction was expressed throughout automobile circles of this city over the actions of the A. A. A. Contest Board at the Indianapolis Speedway races of last week, and there is now considerable call for the rules pertaining to racing so that they may be read and understood. Even though not understood very generally now, the Contest Board is roundly condemned for the eleventh-hour decision, barring out cars which had been entered for some time, and whose appearance had been advertised and used as an attraction to draw people to the races. The Speedway management is not blamed for the incident.

The new plant of the Long Manufacturing Co. on Cass avenue, extending the entire block from Burrs to Amsterdam avenues, Detroit, Mich., is now ready for occupancy and in a few days will be running full blast. This plant is known as Long Factory No. 2, the main offices and principal factory remaining in Chicago, at 1430 to 1434 Michigan avenue. The Detroit plant is two stories and basement, 320 ft. on Cass avenue, by 145 ft. deep on Burrs and Amsterdam avenues. It contains over 100,000 ft. of floor space.

Overland Transcontinental at Chicago

In sixteen days of driving, eleven of which were rainy, Miss Blanche Stuart Scott and her companion, Miss Phillips, have reached Chicago in the "Lady Overland" car, en route from New York to San Francisco. The total distance traveled so far is 1987 miles. Only one mishap of any consequence has happened, and that one was not serious. The car slipped from the crown of a clay road during a rainstorm and cracked several spokes in one of the rear wheels.

Miss Scott was able to take the machine to a blacksmith's shop, where repairs were made under her supervision, and later the wheel was replaced. The iron band that was clamped upon the injured wheel, by order of Miss Scott, is shown herewith. The car and the young women show little effect of the trip thus far.

How the Overland's Battered Right Rear Wheel Was Stiffened

Makers Provide Cars in Brigades for Orphans

ORPHANS' DAY in New York City is noted for the good time the little ones experience, and there is no better way of indicating the attitude of the citizens of the Great Metropolis than to picture the situation as it obtains. It is a great misfortune that space will not permit of presenting the line-up of all the automobiles that were placed at the disposal of the Committee; it is not so much a question of limiting the amount of space which the presentation would take in THE AUTOMOBILE, but the whole paper would scarcely do the subject justice. That the matter should be dropped however, arguing that it is too formidable to handle, is far from the intention, and it is believed that the best way to indicate how well the makers of automobiles responded is to illustrate a few of the "brigades of automobiles" which were sent by the several concerns and their patrons.

Trucks Proved to Be of Great Utility Too

It is the general idea of the average citizen that a truck is a commercial affair, and that it is of no great use beyond toting a ton of coal, or "riding" groceries from the dock to the warehouse.

Possibly these good citizens will be surprised to find that some of New York's most precious possessions are able to experience a bushel of pleasure from using these trucks as substitutes for more elegant limousines and landaulets. The trucks behaved most generously; the orphans were well pleased, and it goes to show that things are not what they seem unless the mind is ripe to appreciate the true situation. Certainly the juveniles found the cushions soft and downy; to be sure the big-hearted drivers were well pleased with their cargo, and on the whole, when the whole situation is fittingly reviewed, the trucks were conspicuous features in the "Grand Review." Some of the makers went in big; they furnished all the pleasure automobiles they could collect together, and trucks were then called into play to fill in the gap. Fig. 1, as here presented, is of a White truck, which brought up the vanguard in supplemental relation to the "White Brigade," as shown in Fig. 3.

In like manner the Packard truck as shown in Fig. 5 was a companion to a long line of Packard automobiles. Then, there was an "Indian file" of Maxwell cars as shown in Fig. 2, not forgetting the Chalmers contingent as presented in Fig. 4.

Scattered along the line for a mile or more were the various makes of automobiles, some in large numbers, all to the extent that they could be commandeered for the occasion. There were cars as follows: Mora, Peerless, Rambler, Locomobile, Elkhart, Jackson, Matheson, Speedwell, Austin, Hupmobile, Croxton-Keeton, Regal, Herreshoff, Morse, Empire, Great Western, Knox, Midland, Parry, Fal-car, Ohio, National, Detroit Electric, Marmon, Woods Electric, Grout, Sebring, Mitchell, Cino, Selden, Chadwick, Cole, Stearns, Baker Electric, Standard, Haynes, Pierce-Racine, Pennsylvania, Patterson, Kissel-Kar, Winton, Cameron, Abbott-Detroit, Owen, Pullman, American, Thomas, Cartercar, Warren-Detroit, Studebaker, Inter-State, Corbin, Halladay, Waverly Electric, Columbus, and others.

It was a well-executed display of the magnanimity of the makers, backed to the limit by the agents and dealers, but the owners must not be forgotten; they were there, as many of them as could be assigned a place in the line, ready to do honor to the little guests who exhibited rare appreciation.

Louisville's Parentless Tots Entertained

LOUISVILLE, KY., June 6—More than 1,000 little orphans were made glad and given the time of their lives Saturday by the Louisville Automobile Club, who gave the little tots a free ride and a trip to Riverview Park. It was the annual outing of the club and the entertainment began at 1 o'clock in the afternoon, when scores of flag-bedecked automobiles went sailing down Broadway, after they had been loaded to the limit at the various orphanages in the city.

There was some disappointment on the part of Ben Watts and his committee in charge of arrangements, because of a heavy rain, but this did not dampen the spirits of the children. Following a long trip through the principal streets, the youngsters were taken to the park, which was turned over to them.

Fig. 1—The big White truck carried its capacity

Fig. 2—The Maxwell contingent was well represented

Reaching the northern entrance the big party was met by Col. Lum Simons, manager of the park. After the children had enjoyed the show at the vaudeville theatre they were treated to all of the cake, ice cream, candy and peanuts they could eat. Again the cars were filled with the Auto Club's little guests and once more the long procession was formed for the homeward trip. The rain had long since ceased and the children were given a taste of the original brand of joy ride as they were taken back to the various institutions.

The Louisville Automobile Club claims to be the originator of the orphans' outing about four years ago. It has been taken up by the different automobile organizations over the country, until now it has become almost a national affair.

Haradon Again Trade Association Head

In the short time that Wm. M. Haradon had occupied the presidency of the New York Automobile Trade Association, filling out the unexpired term of General Cutting, he has so impressed his fellow members, and the trade in general, with his aggressive spirit, and ability as an organizer, that little surprise was manifest at his being the unaimous choice of the association's stockholders, for re-election as the chief executive, at the annual meeting of the association, which was held at the Hotel Cumberland, Monday morning. C. W. Wurster, of Wyckoff, Church & Partridge, was re-elected first vice-president; W. W. Burke, of Carl H. Page & Co., second vice-president; W. H. Yule, of the B. F. Goodrich Company of New York, treasurer, and Walter R. Lee was re-elected secretary and general manager for what will be his fourth consecutive term, C. Andrade, Jr., of the R. M. Owen Company, as counsel for the association, is also a director, with Messrs. W. A. Evans, of the American Locomotive Company; E. J. Harlam, of the Sagamore Garage Company; E. H. Broadwell of the Fisk Rubber Company; Peter Hoyt, of Hoyt & De Mallie Inc.; C. H. Larson of the Oldsmobile Company, of New York; W. C. Poertner, of the Poertner Motor Car Company, and A. J. Inderreiden of the Warner Instrument Company.

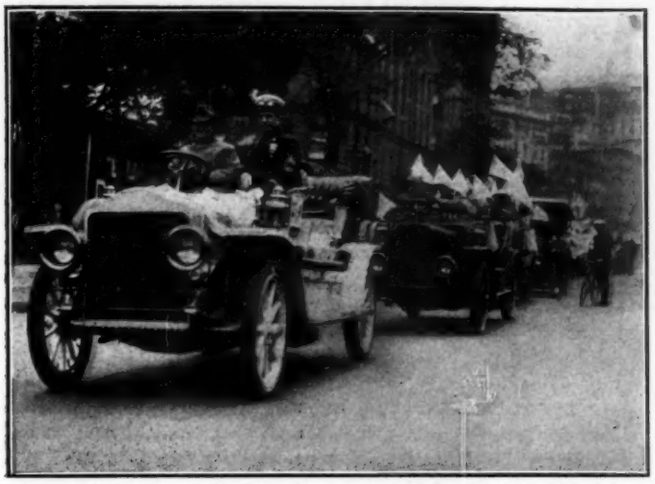


Fig. 3—White Brigade was conspicuous in the line

Of the 12 members of the board, 4 represent big garage interests, 4 are car dealers, and 4 are accessory manufacturers' representatives in this market. This arrangement will undoubtedly have a wonderful tendency toward materially harmonizing existing conditions between these three branches of the industry, and is the most potent argument the association has yet advanced in substantiation of its previously announced intention of regulating the retail selling, and garage business of this city, and exterminating many of the evils now existing, that have heretofore deterred good business men from risking capital in the proper development of this field.

Mr. Haradon announced his committee appointments at the meeting Monday. Interest centers chiefly in the Garage Committee, of which Synday B. Bowman has been made chairman; with him will be J. M. De Mallie of Hoyt & De Mallie Inc.; Benjamin Blumenthal, of the West End Auto Palace; Harry Strasbourger, of the Lenox Garage, and J. L. Joscelyn, of the Joscelyn Stable Company. The Accessory Committee will be made up of A. J. Inderreiden, of the Warner Instrument Company, chairman; Ernest H. Waterman, of the Hartford Suspension Company; E. R. Broadwell, of the Fisk Rubber Company; W. H. Yule, of the B. F. Goodrich Company of New York, and A. A. Hoffman, of the W. C. & P. Auto Supply House. W. C. Poertner, of the Poertner Motor Car Company, has been made chairman of the Contest Committee, with R. H. Johnston, of the White Company, and C. H. Larson, of the Oldsmobile Company of New York, as his associates. The appointment of a Committee on Aviation shows the trend of the times. C. W. Wurster, of the W. C. & P. Company, who is probably the most enthusiastic and practical aeronaut in the city, has been named as chairman, while W. H. Yule, of the Goodrich Company, and A. J. Inderreiden, of the Warner Instrument Company, are his assistants.

Fig. 4—The Chalmers line-up was a parade in itself

Orphans' Day in Other Cities

The sixth annual Orphans' Day outing and picnic was observed in Pittsburg Wednesday, June 1, under the management of the Automobile Club of Pittsburg. Although the weather was very unfavorable, 135 cars were in line and over 800 children enjoyed the outing, twelve institutions taking part. The usual ride of about 25 miles around the parks and boulevards was broken by a stop at the Zoo. The afternoon was spent in Schenley Park, where luncheon was served.

Upwards of one thousand parentless little ones were the guests of the Quaker City Motor Club on June 8 at Willow Grove Park. Over 100 cars were donated by club members and the various local tradesmen, several of the Quaker City papers furnishing the lunch and the Rapid Transit Company donating the use of the park and its numerous attractions.

Arrangements for Orphans' Day, which will be held the latter part of June, under the auspices of the Columbus, Ohio, Automobile Club, are going on rapidly. It is proposed to give at least 2,000 children a picnic at the grounds of the country club.

Fig. 5—Leake Cadets Orphans' Band in the Packard truck

General Motors Threatens to Cut Loose from A. A. A.

THINGS are sizzling in the affairs of automobile racing and contests. There is an electric quality in the air whenever the subject is mentioned where high officials are wont to gather, and the crop of rumors as well as semi-verified reports contain the promise of several interesting developments.

The most notable eddy in the current is the whirl that is centered over the General Motors Company and the A. A. A. as a result of recent happenings at Indianapolis, Worcester, New Haven and prospective happenings in the coming Glidden Tour. Cars made and entered in the first three named of these meetings by the Buick Motor Company and other subsidiaries of General Motors have not been allowed to go in stock car events.

According to an official statement of the General Motors Company, the trouble came to a head over the interpretation of the rules under which the recent Brighton Beach 24-hour race was run, although since then several added factors have become involved in the puzzle. While the question raised at the 24-hour race was one of minor importance, inasmuch as the car disqualified by the referee did not finish very prominently, the appeal from his ruling is still undecided by the Contest Board and may lay the foundation for future difficulty.

But the real breach happened at Indianapolis when the Buick 16A and 16B entries were barred from the stock car races along with several other varieties of motor cars with which the same fault was found by the officials.

According to the statement of the General Motors Company the disqualification was not made in proper form and was delivered to the entrants in the shape of an article published in the press. The grounds for disqualification were based upon the alleged intent of the rules to define a stock car as one that was included in a certain percentage of the type of cars that had already been manufactured prior to the entry of the car in the contest. According to the statement, sharp protest was made in vain to the referee and a bond was offered to cover all contingencies, but a revision of the ruling was denied.

The statement closes with a demand for an amendment of the rules or a different construction of them.

Following the difficulty at Indianapolis, the Buick cars which were subject to the ruling, the Warren-Detroit entry and others have had an interesting experience. At the Worcester hill climb last Saturday one of the Buicks, the Warren-Detroit and the "100" Model Buick were entered. An official decision barred the Buick entries from participation in the stock car events and something happened to the Warren-Detroit. As a result the Buicks were withdrawn from the free-for-alls. At New Haven hill climb, Tuesday, word was sent that the Buicks would not compete, although they were regularly entered.

When this last announcement had been made the report was circulated vigorously that the Buick racing team had been ordered to withdraw from all competition and its entries for the Wilkes-Barre hill climb were annulled.

A spirited colloquy occurred in the official stand at Indianapolis during the recent race meeting on the Speedway when W. C. Durant entered his protest against the disqualification of the cars. He was sharply critical in his position, with Chairman S. M. Butler, of the Contest Board, on the other end of the argument. The situation was exceedingly strained for a while, but was eventually soothed down to a certain extent.

On the other side of the affair, Chairman Butler had the following to say: "The work of the Contest Board is based fundamentally upon the exact definition of the stock car. The competition of specially built cars with those of manufacturers who comply with both the letter and the spirit of the rules would be manifestly unfair to the parties who obey the rules. All stock car contests depend absolutely upon the strict obedience to the rules. Either we can define a stock car and live up to our rules, or we have failed in our purpose.

"With relation to the trouble now developing as a result of our rulings at Indianapolis and elsewhere, I wish to state that the cars barred from the regular stock races did not come within the definition of stock cars under the rules. I understand that the General Motors Company intends to withdraw from competition and that it has ordered its entries scratched in all future events. This move may mean a new association is being planned. I distinctly told Mr. Durant at Indianapolis that I was not present to take abuse from anyone and that the cars barred by my order had not lost the right of being considered on appeal to the Contest Board. I assured him that if the ruling was based on error, the facts in the case could all be brought out in a perfectly legal manner under the rules."

W. C. Durant was not in town or available to get his views on the subject, but an official of the Buick Motor Company confirmed the report that its racing team had been ordered to withdraw from competition. As far as the entries of the General Motors companies are concerned in the Glidden Tour, he could shed no light as to the intentions of his concern.

Chairman Butler, however, said: "There has been some acrimony concerning these entries. So far we have received no definite instructions as to the classes in which the cars are intended to go. For this reason, and as the list of competitors has already been arranged, I have instructed the officials to enter the two Buicks and the two Oaklands under the section to compete for the Glidden Trophy.

"If these cars are not presented and do not measure up to the specifications of the classes in which they have been entered they will be scratched."

Newark Club's Reliability Run

With an entry list of forty cars the reliability run of the New Jersey Automobile and Motor Club, which will be held Saturday, June 11, promises to be one of the most interesting events of New Jersey motordom for the year.

The course as laid out will be 145.1 miles and the cars will go over it twice during the day. The roads are varied, as has been detailed in previous issues of THE AUTOMOBILE, and they have been selected with the idea of giving the entered cars a thorough road test.

The start will be from the club house on Park avenue, Newark, at 5 o'clock in the morning and it is expected that the contestants will finish about 8 o'clock in the evening. Everything points to a strenuous time on the part of the contestants, and the result should benefit the industry.

Maine's First Real Hill Climb

PORTLAND, ME., June 6—Automobile contests have been inaugurated at last in Maine, and a typical hill climb was held Saturday, in which fifteen cars took part. So successful was the affair that it is likely to be an annual feature. The Sunday *Telegram* fathered the event.

Eight contests were run off and good time was made. The course was laid out on Blackstrap Hill, about six miles from this city. Three Buicks won first honors in their classes, and a Ford, Palmer-Singer and Inter-State also won. The entries were limited to stock cars and the drivers were all residents of Cumberland County.

The racing committee consisted of the following: F. A. Nickerson, William Taylor, H. F. Merrill, D. W. Hoegg, Jr., and A. G. Frost.

"Perkins Pays the Freight"—Be Discriminating

By HAROLD O. SMITH, President Premier Motor Mfg. Company.

CONTESTS present a very interesting and live subject for those who are connected with the manufacture or use of automobiles, and for others who are interested because of the fascination, and instructed because of what the contests tell, and enlightened because they pay the bills. It is a startling fact to state to a customer in the purchase of any car that the selling price must necessarily include a certain amount of material, a certain amount of labor, and a certain amount of other items classed as expense because they do not represent either labor or material. But it is also true that every item of expense enters into the cost of the motor car upon which the selling price is based.

Yet, it cannot be said that this is an unjust charge, and possibly the money spent in certain contests, tests, or proving-out, may be the cheapest of all the items charged against the production of the machine. For example, if the expenditure of a small amount revealed unsatisfactory features, or proved what was the most unsatisfactory, the cost of finding this out might be the price of a good and satisfactory car, as against an unsatisfactory or unreliable one.

As an illustration, in a product which is a combination of a number of chemicals, no one would consider presenting to the public, without preliminary tests, an article which must be a harmonious combination to be successful. Motor car contests correspond to those chemical tests, and a motor car must be a homogeneous unit, for its parts must be so designed and proportioned as to work in absolute harmony. Just one unsatisfactory feature may make an unsatisfactory machine, and contests have aided in the development and rapid progress in eliminating undesirable features. In the early days racing proved the quickest means of securing the required experience, though what was called racing eight or ten years ago would be thought a tame affair to-day.

Speed on specially surfaced courses produces abnormal results, subjecting a few parts to unusual strains, while the general construction is probably not tested as much as would be the case in a touring car under ordinary touring conditions covering an equal number of miles. There was a time when frequent mechanical mishaps, delays and road repairs were not only tolerated but expected, but that is past and the public demands cars which can be depended upon to perform on the road in the layman's hands with certainty.

Speed contests and hill-climbs are interesting and more or less instructive, but the conditions are obviously abnormal, while with touring reliability events the conditions most nearly approximate road use, and reflect in a very telling way the results which may be expected of the cars in the service of owners. For example, the Glidden Tour of 1909 required the cars to travel a distance of 2643 miles from Detroit to Minneapolis, Denver and Kansas City, and the schedule required the contestants to cover a mile in every three minutes of time upon the road between those widely separated points, without making adjustments except in a few cases. That a few cars went through without replacements or adjustments reflects in a wonderful way the reliability, simplicity, and durability of the American car, as well as its ability to perform satisfactorily; but still more wonderful was the showing when the same machines were subjected to the technical examination. They were charged for every derangement, loose or lost nut, bolt, or screw, and yet the penalties upon some cars represented almost nothing. This in spite of the fact that there are between three and four thousand different parts in every automobile.

These conditions were the nearest approach to those of regular touring, being over the public highways, and duplicates of the usual touring conditions except that the word "strenuous" should be added. The difference between the results of speed and reliability contests as a criterion in the purchase of an automobile might be summed up in the statement that in the former it is not always the car in the best condition which finishes first.

No Clean Scores in the St. Louis Run

ST. LOUIS, June 6—The St. Louis Automobile Club could hardly have selected a worse day for its third annual reliability run, held last Saturday. The run began in a drenching rain and finished in mud, much of the way up to the hubs. Only twenty cars started, and but twelve finished.

F. H. Semple, driving a Locomobile, was declared the winner of the Hagerman Cup offered for the car making the most nearly perfect score in Class A, touring cars. Samuel J. Pingree was awarded the Class B prize, the Plant-Walsh Cup. He drove a Chalmers. Semple's score was 967, and Pingree's 997. Not a perfect score was made. In addition to the contestants there were the press car, a Marmon, driven by Herman Schnure; a Franklin, driven by W. E. Brearley, for officials, and a half-dozen other non-contesting cars.

The Marmon car driven by A. R. Byrd, Jr., suffered a broken driving shaft and had to drop out at Eureka. Wall's Stearns car caught fire twice en route, and mud was used to extinguish the blaze in each instance. Miss Ada Britton, Pope-Toledo, the only woman driver in the contest, dropped out at the first control.

The run was over a circular route from St. Louis through St. Louis and Jefferson counties and return. The distance was 109.1 miles. Under ordinary circumstances the road for the greater part of the way would have been almost perfect. Early Saturday, however, rain began to fall in torrents, and continued until after noon. By that time the country roads had become softened, and it was a fight through mud, and, in many places overflow from swollen streams.

The distance and time required were as follows: First control, Fenton, Mo., 17.7 miles, 65 minutes; second control, Byrnesville, 17.6 miles, 58 minutes; third control, Cond, 18.6 miles, 85 minutes; fourth control, Creve Cœur, 21 miles, 62 minutes; fifth control, Florissant, Mo., 21.5 miles, 63 minutes; sixth control, King's Highway and Forest Park boulevard, 12.5 miles, 45 minutes. Total number of miles, 108.9. Total time allowed, 358 minutes. The summary:

ENTRANTS IN CLASS A

No. Name of Car	Entrant	Standing
6—Locomobile	F. H. Semle	967
9—Matheson	R. L. Smith	964
28—Cadillac	John H. Flachmann	944
24—Cadillac	F. H. Pingree	938
21—Cadillac	A. A. Kelly	927
7—Marmon	W. A. Meletio	902
5—Mitchell	C. M. Barnard	872
35—Locomobile	C. H. Albers	869
22—Kissell	Dr. O. T. Upshaw	862
3—Cadillac	J. L. Boland, Jr.	...
18—Packard	Jos. Dickson, Jr.	...
17—Marmon	A. R. Byrd, Jr.	...
10—Stearns	Chas. W. Wall, Jr.	...
29—F-A-L-	J. L. Adrien	...
12—Pope-Toledo	F. H. Britton	...
20—White	P. D. C. Ball	...

ENTRANTS IN CLASS B

25—Chalmers	Sam S. Pingree	997
19—Hudson	S. E. Wolff	715
23—Buick	W. H. Boehmer	...

Good Roads

(*Continued from page* 1035.)

erected, some of which were improvised out of farm wagons, others in divers hasty ways, but they were all decorated and occupied, the ladies in their best, the children in Sunday garb, all provided with ammunition in the form of flowers with which they pelted the participants of the contesting automobiles as they trailed along, maintaining a fixed alignment, and gracefully accepting the tribute, entering into the spirit of the occasion.

The noon control was at Spartansburg, N. C., where the tourists were given a magnificent reception, and a luncheon was tendered on the grounds of Converse College, which is the most noted girls' educational institution in the South. The privilege of the Spar City Club was extended to each of the contestants as the respective cars entered the grounds; the evidence of privilege was in the form of an embellished card. As a further evidence of the welcome offered, fifteen automobiles, holding the leading citizens of Spartansburg, with Mayor J. Boyce Lee, Hon. Charles O. Hearon of the National Highway Commission, Hon. T. J. Harris, Jr., and Victory Montgomery in the leading car, met the tourists at Greer, made them welcome in brief but fitting speech, and escorted them to the college grounds.

The general committee of entertainment included Mrs. A. W. Smith (chairman), Mrs. V. M. Montgomery, Mrs. J. W. Simpson, Mrs. Warren Dupre, and Mrs. C. H. Henry. The general committee was staunchly supported by the ladies who presided over the tables. It will be remembered that a luncheon was tendered the tourists a year ago under substantially the same conditions, so that the affair on this occasion was particularly enjoyable.

Cordial greetings were extended by the citizens of Gaffney, Blacksburg, and Gastonia. When the head of the line reached the main street of Gastonia it was confronted by a galaxy comprising a hundred pretty girls, all dressed in white, and waving small American flags; the town was decorated as befitted the occasion, and a sign stretched across the main street bearing the words "Speed Limit 25 Miles an Hour—Run As You Like, Our Motto." McAdenville, a thriving industrial center on the approach to Charlotte, closed down its mills during the passing of the paraded cars, and the citizens gathered en masse to witness the passing of the automobiles. Likewise, at Kings Mountain, and in fine, at every village on the wayside, decorations were profuse and appropriate, and the citizens made a holiday of the occasion.

What the Tourists Encountered on the Second Day

On the second day, from Anderson, S. C., the first car left at 7.30 a. m. The roads to Spartansburg, the noon control, a total distance of 67.3 miles from Anderson, were in very good condition, and the tourists found no trouble to get there on schedule. After leaving Spartansburg and passing through the towns of Cowpens, Gaffney and Blacksburg, the tourists crossed the State line into North Carolina, the distance being 103.8 miles from Anderson.

The roads in North Carolina were the worst so far on the tour, being full of treacherous holes and bad turns, and in many places it was necessary for the cars to carry chains in order to pull through mud holes resulting from the recent rains. About 25 miles out the travelers struck a fine macadam road which carried them into Charlotte, a total distance of 156.6 miles for the day's run. All of the cars finished the day's run in perfect running condition with the exception of one car, a Stevens-Duryea, No. 63. There were seven cars penalized in to-day's run, as follows: No. 21, Pope-Hartford, 17 points; No. 29, Stoddard-Dayton, 48 points; No. 39, Selden, 17 points; No. 43, Maxwell, 164 points; No. 48, Ohio, 108 points; No. 55, Ohio, 48 points; No. 69, Columbia, 20 points.

The running time for to-morrow, June 8, from Charlotte, N. C., to Martinsville, Va., a distance of 145.6 miles, is 9 hours for Classes 4, 5, 6 and 7; 9 hours 54 minutes for Classes 2 and 3, and 10 hours 48 minutes for Class 1. The running time for the third day will be the same as the first two days of the tour, with one hour added for noon and luncheon control at Winston-Salem. The additional penalties for cars on the first day's run, June 6, are as follows: No. 47, Pullman, 304 points; No. 44, Velie, 688 points.

There are eight official cars in the tour: a White Steamer, 40 horsepower, carrying Major John S. Cohen, of the Atlanta *Journal*, and Hamilton Peltz, the manager of the tour; Ray M. Owens in Reo Pilot; Columbia carrying Referee Charles Jerome Edwards, and other officers; a Pierce-Arrow carrying James R. Gray, owner of the Atlanta *Journal*, and his family; a Lozier car with tires; a Welch-Detroit carrying Alex Schwalbach of New York, secretary and starter, and a White gasoline car carrying the Technical Committee.

Dead Horse Hill's Record Still Stands

(*Continued from page* 1037.)

cester Automobile Club are as follows: Daniel F. Gay, president; Chester E. Greene, vice-president; Henry F. Blanchard, secretary, and Milton C. Snyder, treasurer. The summary:

CLASS A—Open to any gasoline motor car (other than motor cars with solid tires, wheels 36 inches in diameter and over) which complies with the definition "stock car." This class ran in the following divisions:

No.	Car	Driver	Time
		Event 1A—$4,000 and over	
1	Thomas Flyer	John J. Kingsley	1:06 4-10
		Event 2A—$3,001 to $4,000	
1	Stearns	R. H. Higgins	1:53
		Event 3A—$2,001 to $3,000	
1	Atlas	Elmer G. Knox	1:31 2-10
		Event 4A—$1,601 to $2,000	
1	Jackson	R. M. Lovejoy	1:10 9-10
2	Oakland Roadster	Howard A. Bauer	1:30 8-10
		Event 5A—$1,201 to $1,600	
1	Cameron	E. S. Cameron	1:38 6-10
2	Parry	Eddie Ditteau	1:56 7-10
		Event 6A—$801 to $1,200	
1	Cameron	F. F. Cameron	1:33 9-10
2	Oakland	Howard A. Bauer	1:43
3	Maxwell	Martin Dorley	1:47 1-10
4	Buick	Duncan Hooker	2:24 6-10
		Event 7A—$800 and under	
1	Cameron	Albert White	1:49 1-10
		Event 9—Free-for-All	
1	Fiat	Caleb S. Bragg	:58
2	Alco	Harry F. Grant	1:02
3	Jackson	R. M. Lovejoy	1:08 8-10
		Event 10—Amateur Event (Owners to drive)	
1	Stanley Steamer	Jay Clark, Jr.	1:09 9-10
2	Lancia	Nelson Slater	1:33 3-10

CLASS B—Open to any chassis of a gasoline car which is in accordance with the definition of a "stock chassis," to be governed by the following table of piston displacement and minimum chassis weight:

		Event 12B—161 to 230 cu. in., 1,400 lbs.	
1	Staver-Chicago	F. A. Wheelock	1:25 1-10
2	Cole "30"	Frank D. Costello	1:26 1-10
3	Lancia	Réné La Loumier	1:40 3-10
4	Maxwell	Thomas Costello	1:41
		Event 14B—301 to 450 cu. in., 2,000 lbs.	
1	Jackson	E. P. Blake	1:11 4-10
2	Berkshire	Stuart N. Clapp	1:23 6-10
3	Oakland Roadster	Howard A. Bauer	1:29
		Event 15B—451 to 600 cu. in., 2,300 lbs.	
1	Alco	Harry F. Grant	1:02 1-10
		Event 18—Free-for-all, gasoline stock cars only	
1	Alco	Harry F. Grant	1:01 2-10
2	Thomas Flyer	John J. Kingsley	1:04 8-10
		Event 19—Record of hill	
1	Fiat	Caleb S. Bragg	1:00 3-10
2	Alco	Harry F. Grant	1:01 8-10
3	Stanley Steamer	Fred H. Marriott	1:09 3-10
		Event 20—Amateur Event, gasoline cars only	
1	Thomas Flyer	John J. Kingsley	1:05 8-10
2	Lancia	Nelson Slater	1:33
		Event 21—Exhibition Event, Stock cars, steam or electric	
1	Babcock Electric	F. A. Babcock, Jr.	3:06 9-10

Giant Crowd at Shingle Hill Climb

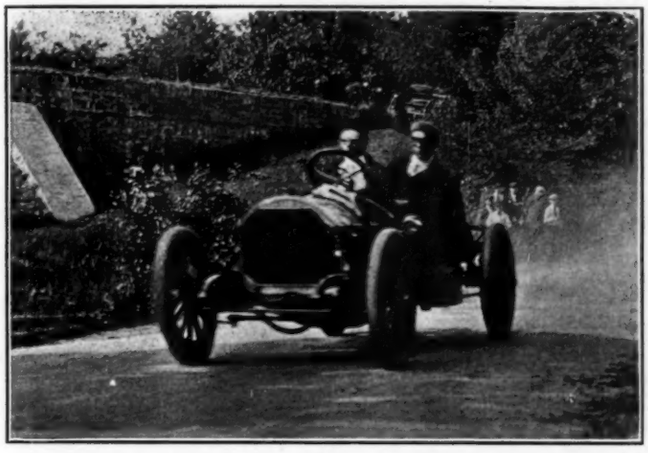
NEW HAVEN, June 8—Fully 50,000 persons witnessed the fourth annual hill climb of the Yale Automobile Club, yesterday, on Shingle Hill, near West Haven. Six automobile events, five of them for stock cars and one free-for-all, were carded. There was a very large attendance from out of town and in addition to many citizens of New Haven and surrounding cities, the college students were present in force.

The hill course is 5,320.50 feet long and is picturesquely located five miles west of this city. It consists of a series of rises, finishing with a gradient of 162 feet. About midway of the course there is a dangerous "S" curve cut through the rocky hillside. This had been much improved and straightened since last year, but still afforded an element of peril to the racers.

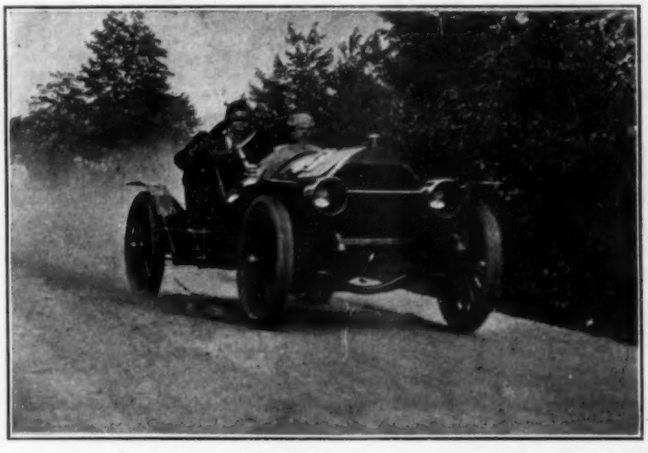
The timing device was simple but was not along the lines of the automatic arrangements that have been used elsewhere. The plan used involved the registration of the time by two officials.

The Yale Auto Club Committee which had charge of the climb was composed of: L. S. Cullen, chairman; C. D. Winslow, H. H. Logan, T. W. Case, John Hays Hammond, Jr., and W. A. Main.

The officials of the meeting were as follows: Referee, C. H. Gillette, president of the Hartford (Conn.) Auto Club; clerk of the course, C. D. Winslow; assistant clerks of course, L. S. Allen, D. B. Prentice, O. Jimenis, H. D. Matheson, R. N. Hall; starter, F. J. Wagner. Representative of the F. A. M., J. M. Boyce; timers, N. Young, C. Tenis, R. Page; judges, C. M. Robinson, counsel for New Haven Automobile Club, W. T. Dill, Paul S. Thompson, W. A. Main; telephone operators, R. K. Haas, R. Dougherty, R. Brown; chief of patrol, W. J. Ralston.

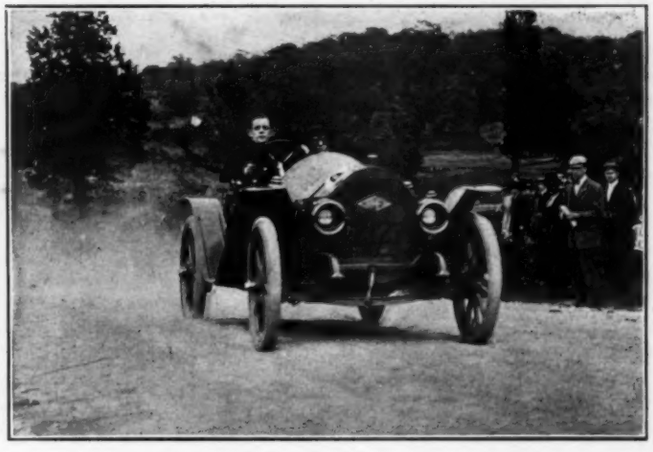


Buick Driven by E. C. Bull winning in Class E



Knox to the front in the Class F event

Amplex captured the honors in Class G



Correja, the Class D winner, driven by T. Taylor

Summary of Results of Yale Automobile Club's Hill Climb

Class D, for stock cars listed at $1,600 and under

No.	Car	Driver	Time
8	Correja	J. Taylor	1:13
18	Buick	E. C. Bull	1:18 4-5

Class E, for stock cars listed at from $1,601 to $2,000

19	Buick	E. C. Bull	1:14
33	Buick	A. McMullen, Jr.	1:15 2-5

Class F, for stock cars listed at from $2,001 to $3,000

3	Knox	H. J. Belcher	1:06
10	Chalmers	W. Knipper	1:10

Class G, for stock cars listed at from $3,001 to $4,000

16	Amplex	T. Jones	1:09 1-5
12	Palmer-Singer	Pollman	1:09 3-5

Class H, for stock cars listed at $4,000 and over

5	Houpt-Rockwell	F. Ives	1:07 2-5
1	Simplex	R. B. Stern	1:08 1-5

Free-for-all

2	Simplex	George Robertson	:51 4-5
14	Fiat	Caleb Bragg	:52 2-5
3	Knox	H. J. Belcher	1:01 4-5
10	Chalmers	W. Knipper	1:10 1-5

Winners in Central New York Relay Run

SYRACUSE, N. Y., June 6—In the recent successful Central New York Relay Club Run, H. S. H. Wilson, driving a Thomas car, was the only entrant who was fortunate enough to win more than one prize, all the other lap prizes going to different contestants. The secret time for each of the eleven laps of the run was set and sealed and placed in the custody of Mayor Edward Schoeneck, of Syracuse, previous to the start on Saturday morning, May 28. On Thursday last the envelope containing the secret times was opened and the following were found to be the winners:

Lap. Syracuse—	Secret Time.	Winner.	Car.	Time.
to Auburn	1:46	H. S. H. Wilson	Thomas	1:44
to Cortland	2:57	Leon W. Quick	Buick	2:45
to Ithaca	1:29	A. F. Stilson	Stevens-Duryea	1:28
to Watkins	1:51	Dan'l Rothschild	Winton	2:07
to Elmira	1:36	Geo. E. Messer	Franklin	1:35
to Owego	2:07	Theo. Friendly	Selden	2:05
to Binghamton	1:38	Harry L. Conde	Brush	1:28
to Oneonta	3:35	E. R. Caldwell	Pullman	3:19
to 5-Mile Point	1:28	L. P. Butts	Elmore	1:34
to Oneida	2:23	H. S. H. Wilson	Thomas	1:51
to Syracuse	1:56	T. F. Willis	Oakland	1:47

A prize medal in the form of a watch fob, suitably engraved will be forwarded to the winners on or before July 1. Medals were also awarded to H. T. Gardner, driver of the Franklin press car; Fred Van Tyne, driver of the Rapid truck; J. A. Seitz, the official photographer (Franklin), and Walter A. Phillips, driver of Deputy State Highway Commissioner Frank D. Lyons' Thomas car, for completing the entire run.

The event has given a great impetus to the cause of good roads in Central New York.

Blanks Ready for Sentinel Run

MILWAUKEE, WIS., June 6—Official entry blanks for the Wisconsin State Automobile Association reliability contest for the Milwaukee *Sentinel* Trophy on July 18, 19, 20, 21 and 22, have been issued by George A. West, chairman of the special contest board. The contest will be held under the rules and regulations of the Contest Board of the A. A. A. The entrance fee is $50 per car. Entries must be sent to Mr. West at 1215 Railway Exchange Building, Milwaukee, Wis., before midnight of July 12, 1910. Competing cars will be numbered in the order of receipt of application.

David Beecroft, chairman of the Contest Board of the A. A. A., has accepted the appointment as technical examiner before and after the contest.

The tour will start from Milwaukee on the morning of Monday, July 18. In the five days of running, 780 miles will be covered. The main prize is the Milwaukee *Sentinel* Trophy, valued at $750. Manufacturers and members of the association intend to hang up lesser prizes. Matthew C. Moore, president of the W. S. A. A., will act as pilot. Mr. Moore blazed the trail during the latter part of May and the result of his observations will be compiled in pamphlet form for the benefit of entrants.

All Penalized in Oklahoma Run

OKLAHOMA CITY, OKLA., June 6—With one perfect road score and none on the technical examination that followed the close of the run, the Contest Board in charge of the Reliability Run of the Oklahoma Automobile Association, 814 miles over the State last week, announced, Sunday, the official result, declaring the Parry, driven by L. M. Dull, to be winner of the trophy donated by the *Daily Oklahoman*. Only six of the twelve cars that started finished the trip, and three out of these were disqualified for leaving the route. The Franklin, which finished with a perfect road score, will contest, as will the Velie.

Final Road Scores, June 4: Franklin, 1,000; Velie, 998; Velie, 994; Velie, 998; Velie, 994; Parry, 989; Oakland, 983; Ford, 962.

Final Standing After Technical Examination: Parry, 976; Ford, 938; Velie No. 2, 783; Velie No. 1, Oakland, and Franklin disqualified for leaving route.

25 Entries in the

RICHMOND, VA., June 7—The entries for the Carolina Endurance Run, from Richmond, Va., to Raleigh, N. C., and return, were closed Wednesday night, June 1st, at midnight, and twenty-five contesting cars will take part in the second contest given by the *Times-Dispatch*, Richmond, in the interest of good roads in Virginia and North Carolina. As was the case in the Virginia Run, the American Automobile Association and the Richmond Automobile Club will furnish officers for the run, which will be under rules of these organizations.

Several of the contestants in the previous run did not enter the Carolina contest owing to the fact that no cars were available at several of the garages of the firms entering cars for the Virginia contest. F. E. Nichols, whose Reo won the sweepstake cup before, could not enter for this reason, while the Ford Motor Company made no entry on account of dissatisfaction with the ruling of the officials in the previous run. Miss Anne Dunlop, of Petersburg, the only lady contestant of the Virginia contest, will drive her car over the course, but not as a contestant.

The twenty-five cars entered will carry about eighty-five passengers, of whom about twenty-five will be wives and daughters of the contestants.

A meeting was held on Monday evening at which those taking part in the run were instructed by the referee. All cars were delivered to the technical committee for examination on Monday at noon, and were thoroughly gone over.

The route selected is a most picturesque one, a number of rivers being crossed and many places of historic interest passed. The road from Richmond to Petersburg is in splendid condition and after crossing the Appomattox River, through Petersburg and to the Greensville County line, fairly good roads are found, and when this is passed the best roads in Virginia are reached. The Roanoke River is crossed by a fine steel bridge, at Roanoke Rapids, a beautiful bit of natural scenery, and from here the road stretches like a white ribbon to Panacea Springs. The second day the roads are equally as good, the charming cities of Warrenton and Henderson being visited, as well as Wake Forest College and the Falls of the Neuse, the night being spent at Raleigh, N. C. On the third day the course will extend through Durham and on to Chapel Hill, where a brief stop will be made to allow a visit to the University of North Carolina.

The return to Durham is made over a fine stretch of macadam pike, and at that city Mayor Griswold will entertain the party with luncheon. Oxford will then be visited, and recrossing the Roanoke River the night will be spent at Clarkesville, where the entire population has extended an invitation of hospitality. The last day will include the old Boydton plank road, a unique stretch, Boydton, South Hill, Lawrenceville, Petersburg, and the return to Richmond, the cars reaching the starting point before 5 p. m.

Upon arrival of each car it will be turned over to the technical committee for examination and comparison, and with the reports of the observers, the judges will decide the awards.

The officials of the Carolina Run are as follows:

Dr. H. W. Bassett, referee; Otis M. Alfriend, A. A. A. representative; Robert B. Alport, chief observer; W. B. Nelson, timer and checker; Jonathan Bryan, pacemaker; Otis M. Alfriend, E. W. Farley and Dr. H. W. Bassett, technical committee.

Dr. Stuart McGuire will furnish the pilot car, and Car No. 3 will carry the officials.

Apropos of the forward impulse given the good roads cause by the Carolina run, reports from various points throughout the Old Diminion show much new road construction, which is welcome news to autoists.

In Washington County, the supervisors are planning to construct $200,000 worth of new roadway, beginning work this year,

Carolina Endurance

while adjoining Washington County, just over the Tennessee line, Sullivan County is spending $300,000 for this purpose.

Greensville County, Va., will build twenty-eight miles of good roads, the contract being let at $1,200 per mile. Spottsylvania County will have over twenty-five miles under construction shortly, at a cost of about $1,750 per mile. Much of the new roads will be of macadam and gravel.

In Fairfax County, six miles of road will be put in first-class shape, and reports from many other points show marked improvements in the roads in almost every county in the State during this year.

Though the matter has not reached any definite proportions, autoists in this city are said to be talking over the holding of a show here. With the automobile so popular among almost all classes in the State, such a venture would no doubt prove a highly successful one.

OFFICIAL ENTRY LIST IN CAROLINA ENDURANCE RUN

No.	Cars.	Entrants.
1	OLDSMOBILE	Dr. Stuart McGuire
2	E-M-F	Jonathan Bryan
4	BUICK 17	T. E. Williams
5	REGAL	S. Stagg
6	RAMBLER 53	E. J. Allen
7	RAMBLER 54	E. J. Allen
8	RAMBLER 54	C. B. Richardson
9	BUICK 17	Foster Motor Car Co.
10	CHALMERS 30	E. L. Pelouse
11	CHALMERS 40	Dr. R. C. Bryan
12	CHALMERS 30	J. T. Palmatory
13	BUICK 17	Rufus Williams
14	OVERLAND	J. J. Tignor
15	OVERLAND	Dr. Benjamin A. Hord
16	MAXWELL	Dr. Samuel McAnally
17	OVERLAND	Dr. W. H. Parker
18	BUICK 17	J. R. Williams
19	WHITE	B. A. Blenner
20	OLDSMOBILE	B. A. Blenner
21	STEARNS	B. A. Blenner
22	OLDSMOBILE	J. J. Ballou
23	HUPMOBILE	Richmond Motor Co.
24	SPEEDWELL	Speedwell Motor Co.
25	HUDSON	E. D. Hotchkiss, Jr.

There are numerous and varied makes of autos visible on the streets of Richmond, Va., but among them the most noticeable by their number in their class are the Hupmobile and the Buick. Richmondites buying a small car almost invariably choose the former, while the latter appears in many different styles and sizes.

Two Protests in Worcester Climb

Protests have been filed with the Contest Board against the Jackson and Lancia entries, which performed so well in the recent Worcester hill climb. Discussing the matter, Chairman Butler said:

"The Jackson car, model 59, is shown in the catalogue of that company, stripped to its lowest terms. The contention is made that the car that took part in the stock car event answered the specifications of that model as contained in the certificate on file with this board and advertised by the company, and this technicality seems to bring it within the letter of the rules even if it was outside as far as the spirit is concerned.

"The Lancia car is made abroad and is sold f. o. b. New York in form similar to a stripped chassis.

Many Enter Wilkes-Barre Climb

WILKES-BARRE, PA., June 6.—Entries for the fifth annual hill-climbing contest of the Wilkes-Barre Automobile Club have been coming in rapidly and the outlook is that there will be more cars and a greater number of famous drivers in the contest on Saturday, June 11, than for any of the previous events. The first entries were received from the Knox Automobile Company, which will have cars in the free-for-all, the event for the Hollenback Trophy, and for cars with a piston displacement of 301 to 450 cubic inches. Fred Belcher will drive them. The National "Forty" car has asked for entry blanks for the Hollenback Trophy, the free-for-all, for runabouts costing $3,000 to $4,000, and for runabouts costing $4,000 and over. The Houpt-Rockwell Car, Stanley Martin driver, has been entered in the free-for-all. The General Motors Company expects to enter cars in several events, and Louis Chevrolet will drive them. Other drivers who are expected to compete in the climb are Bruce Brown, who holds the record for the hill, made last year with a Benz; Ralph DePalma; Bragg, who has not yet tried the course; George Robertson, and others. The entries closed Monday, June 6, at midnight, with the secretary, P. S. Ridsdale.

The course is now in excellent shape, the water breaks have all been removed and replaced with underground drain pipes, and the cool damp weather has aided in packing the course until it is in fine condition. General C. B. Dougherty, Commander of the Third Brigade, N. G. P., will be in charge of the policing arrangements on the day of the climb and will have a large force of State constabulary on guard. The hill will be open for the contestants to practice on Wednesday, Thursday and Friday of this week, and special police will guard it.

"Munsey Historic Tour" Plans Under Way

PHILADELPHIA, June 6—Plans for the 1910 Munsey tour are now well under way. The contest, which, by the way, will be officially entitled "The Munsey Historic Tour," will be run under Grades 2 and 4 of the A. A. A. rules—contestants in Grade 2 being penalized for time, road work, final operative tests and final technical examination, this group consisting of cars entered by manufacturers and agents; entrants under Grade 4 consisting for the most part of cars privately owned, but which will be compelled to follow the same route as the Grade 2 cars, with no supplementary tests or technical examination.

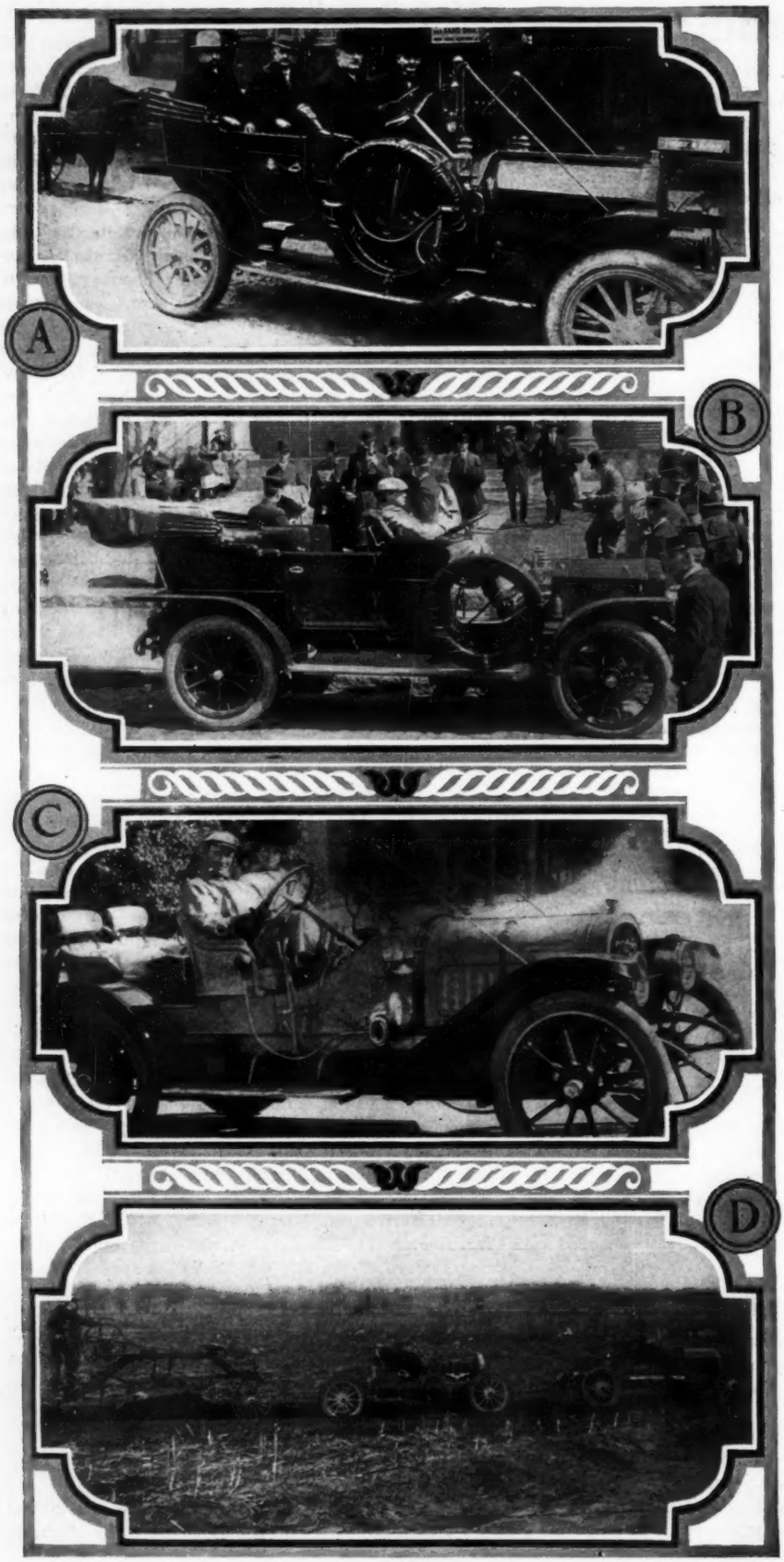
The tour will start from this city August 15, and end in Washington, D. C., two weeks later. The itinerary, as at present outlined (slight changes may be necessary where the pathfinders discover that hotel accommodations in summer resort towns may be inadequate), includes the following principal cities and towns: Philadelphia; Morristown, N. J.; West Point, N. Y.; Lenox, Mass.; New London, Conn.; Boston, Mass.; Portsmouth, N. H.; Portland, Me.; Plattsburg, N. Y.; Saratoga, N. Y.; Binghamton, N. Y.; Harrisburg, Pa.; Gettysburg, Pa.; Baltimore, Md., and Washington, D. C.—approximately 1,700 miles.

The historic feature of the run will doubtless appeal strongly to the tourists, such revolutionary landmarks as Independence Hall, Philadelphia; the battlefields of Trenton, Princeton, Morristown, Stony Point, Bunker Hill, Concord and other lesser conflicts being on the route; not to mention Gettysburg, Frederick and other fields of strife which will recall the terrible days of 1861-65. The pathfinder will start from this city June 15.

Experts Will Discuss Good Roads

SAVANNAH, GA., June 6—All is in readiness for the annual meeting of the Federation of Good Roads which will convene in Savannah Wednesday.

The sessions will be full of interest and will be held in the Guards' Hall, where talks on practical road-making will be the order of each day's session. Judge W. F. Eve is president.



A—Party of Omaha City Officials in Inter-State Car Inspecting the City
B—President Taft Going Home From Church in His White Steamer, Millbury, Mass.
C—Frank L. Chance, Famous Baseball Player, at the Wheel of His Pope-Hartford
D—Great Western Cars Pulling Plows in Work Near Indiana Factory

MAKING A DEMONSTRATION

(A) As exemplifying the widespread use of the automobile by municipalities and municipal officers the first picture shown is that of Omaha's mayor and chief of police in an Inter-State car. At the wheel is J. J. Donahue, chief of police of that thriving Western city, while the man beside him is the mayor, J. C. Dahlman, often spoken of as the "Cowboy Mayor." The other occupants of the car are George Rogers and C. J. Karbach, secretary of the fire and police commission. All three of the city officers shown are enthusiastic over the application of the automobile to many difficult problems of city administration.

(B) In marked contrast to all of his predecessors, President Taft has taken to the automobile not for isolated use, but for continuous and permanent use, availing himself of its help at any and all times. In this use, too, he shows considerable partiality to the White steamer, the picture showing him about to enter his White car at Millbury, Mass., upon the occasion of his recent visit there. The picture shows the Chief Executive leaving the Unitarian Church with his aunt, Miss Delia C. Torrey.

(C) Now, the baseball man is in the limelight, this being essentially his time of year, all of the major and minor leagues having just got fairly started. The picture shows one famous player who has taken to the automobile, Captain Frank L. Chance, manager, captain, and first baseman of the Chicago National League club, more familiarly known as "The Cubs." The car of Mr. Chance's choice, the one at which he handles the wheel, is a Pope-Hartford, purchased during the Winter at Los Angeles from the Pope agents there.

(D) In the modern scheme of testing out a car before calling it finished, nothing is too strenuous for the ubiquitous tester to tackle, nothing feazes him. Here is shown a pair of them, employed by the Great Western Automobile Company, Peru, Ind., helping out on some heavy plowing. The front machine is attached to the second by means of a chain while the rear automobile has a stout wire cable connecting it with the plow. This road work is excellent in two ways; it makes the roads better for other people, and it serves as a very good test-out for the cars.

The Carnegie Steel Company officials are going to have a tour through the Pittsburg district and the Mahoning and Shenango valleys. They will start from Pittsburg June 16 and will make a run to Bedford Springs, Pa., 120 miles and return.

In the Realm of the Makers

The American Dismountable Rim Company, of Cleveland, Ohio, was incorporated with an authorized capital of $50,000 by George B. Harris and others, to manufacture a patented automobile rim.

The Pierce Motor Company, of Racine, Wis., has completed its plans and specifications for 1911 Pierce-Racine cars. The first model will be issued about July 1. It is said that the 1911 car shows few changes over the 1910 car. The draftsmen and designer are now turning their attention to plans and specifications for 1912 cars.

The Cartercar Company, of Pontiac, Mich., has taken an option on several blocks of land adjoining its factory, and plans are now being made for extensive additions to the plant. The work will be pushed rapidly, and it is the intention to have the additions completed in time to begin turning out the 1911 models early in the Fall. It is expected that the additions will enable the output to be doubled in 1911.

The Federal Rubber Company has opened its own branch in Atlanta, Ga., at 170 Peachtree street, where will be carried a full and complete line of automobile tires and tubes of its manufacture, together with a full line of solid and truck tires, as well as its complete line of molded goods. This branch will be in charge of G. M. Seewald, late of the firm of Alexander Seewald Company, formerly local representatives of Morgan & Wright.

Branch managers of the Diamond Rubber Company recently held a conference in Akron. Among those who attended were: E. P. Weber, Boston; E. H. Fitch, Philadelphia; N. E. Oliver, Buffalo; L. K. Ritterhouse, Pittsburg; C. B. Myers, Cleveland; C. H. Smith, Chicago; W. E. Roby, Minneapolis; H. J. Lee, Atlanta; E. B. Tozier, Cincinnati; A. L. Gustin, Kansas City; H. J. Woodard, New York; J. G. Goudie, Detroit, and C. E. Matterson, San Francisco.

The Royal Rubber Company, one of the newer rubber plants of Akron, will soon start the erection of extensive additions to its plant, which occupies the old buildings of the Empire Mower & Reaper Company. The Royal company proposes to increase its output to include motorcycle and automobile tires. Up to the present time it has confined its output to druggists' supplies. O. C. Alling, of New York, is president of the company; J. H. Baird, New York, vice-president and superintendent; T. O. Evans, Akron, secretary, and J. C. Gibson, Akron, treasurer and general manager.

A by-law authorizing the sale of three and one-half acres of the recently acquired 20-acre factory site to the Regal Motor Company has been passed by the Windsor (Ont.) Council by a vote of 378 for and 21 against. The deal will be closed and the company will break ground for a plant.

O. H. Sebring, head of the Sebring Automobile Works, of Sebring, Ohio, has announced that a plant 500 feet long will be built in Sebring for the manufacture of the "Sebring Six." Mr. Sebring says the plant will employ 700 men and will cost $200,000.

The Middleby Automobile Company, of Reading, Pa., has recently completed extensive improvements to its factory, including a foundry, paint shop, upholstering and wood-working department. This means the employment of about fifty more men. The company is now turning out a large touring car, a toy tonneau, a single and double rumble and a surrey.

Nashville's first auto factory was assured by the taking out of a charter for the Southern Motor Works last week by officers of the company now at Jackson, and prominent Nashville capitalists. The capital stock of the new company is fixed at $400,000, and Exile Burkitt, of Jackson, has been elected president, A. H. Robinson, of Nashville, vice-president, and W. H. Collier, manager. The incorporators of the company are: A. H. Robinson, Exile Burkitt, Johnson Bransford, J. H. Ambrose, J. L. Wisdom, G. M. Neely, G. W. Killebrew, and J. W. Love. The old Phœnix cotton mill has been secured and will be fitted up for the factory. This work is already under way and early next month the removal of the machinery from Jackson will begin.

Doings in the Garage World

The Toledo Garage & Supply Company has opened a garage at 713 Jefferson avenue, Toledo, where in addition to doing a garage and supply business it will conduct a repair department.

The Krouse Motor Car Company, 317-321 North Broad street, Philadelphia, is the first concern to take advantage of the improved pavement on Market street and has just established a branch house on that thoroughfare at No. 615. William C. Chambers has been appointed manager.

The Weber Implement Company, the St. Louis agent for the Mitchell, has been appointed representative in Eastern Missouri and Southern Illinois for the Rapid truck. A garage will be maintained at 4921 Delmar boulevard, where a repair shop and truck maintenance department will be installed. J. E. Burton will have charge of the truck department.

The Whittaker Motor Car Company has changed its name to the American Garage Company, and is now installed in a pretentious garage at 5875-81 Delmar avenue, St. Louis. The building contains 15,700 square feet of floor space, and will accommodate 90 cars. In addition to the agency for the Everett "thirty" the company has obtained that of the Rambler. An electric charging plant will be maintained. The members of the firm are A. G. Whittaker and Ira L. Bell.

Among the Various Agencies

S. H. Marvel, 1607 Hunting Park avenue, Philadelphia, has been awarded the local agency for the Wisco, a Janesville, Wis., product.

George B. Clay and H. E. Browne have taken the Philadelphia agency for the Cameron car, with headquarters at 1318 Ridge avenue.

The Commercial Automobile Company has secured the agency for the Edison storage battery in St. Louis territory. The company will retain the agency for the Frayer-Miller truck.

C. S. Cummings, of the Seattle branch of the Metropolitan Motor Car Company, reports that he has secured the local agency for the "Lancia" car. This concern has recently added $5,000 of automobile accessories.

Harrington & Green, with temporary offices at 310 Odd Fellows' Temple, have just acquired the Philadelphia sales rights for the Firestone-Columbus. P. M. Green and E. Harrington constitute the new company.

The Gray Motor Car Company has taken the St. Louis agency for the Kline-Kar. W. Ashley Gray, the moving spirit of the company, formerly was connected with the Dorris company. He is maintaining offices in the Liggett Building.

George R. Dunville has been appointed to the agency in St. Louis of the Kisselkar. This agency formerly was held by the Acme Automobile Company, which has retired from business. Mr. Dunville is located at 502 South Seventh street.

THE HARRIS "SILENT SALESMAN"

To attract attention to its long-established and well-known product, the A. W. Harris Oil Company, of Providence, R. I., is giving away free to its dealers the excellent store and garage fixture illustrated

herewith. It is called the "Silent Salesman" counter display, and should prove of inestimable value to dealers in attracting attention to the Harris product. Dealers desiring to install this sale-provoker will be supplied on request.

Seen in the Show Window

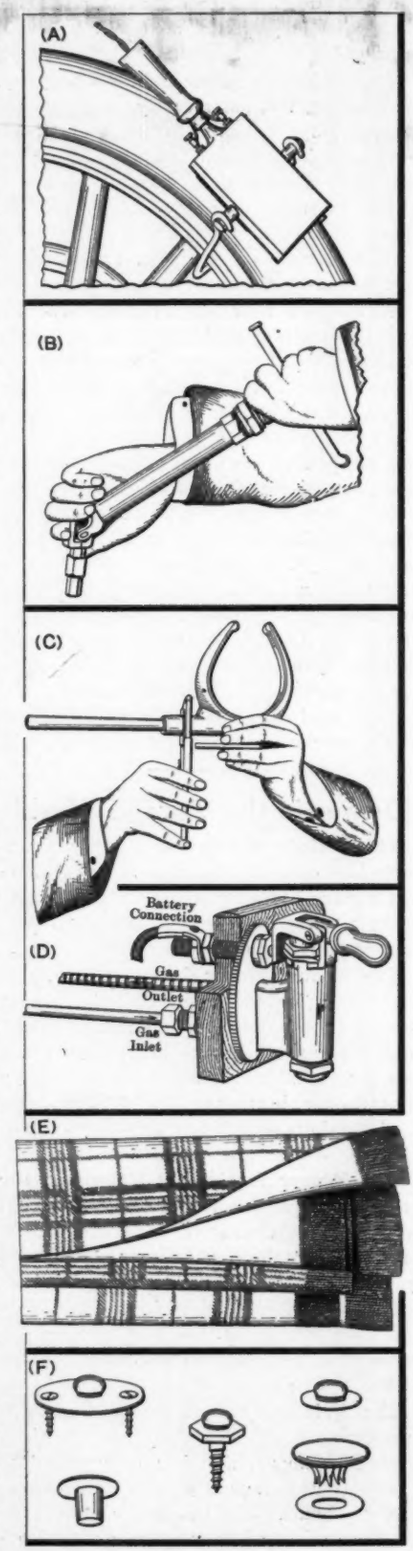
AWAKENING to the cost of tires, autoists are permitting themselves to study economy, and the ways of the wise. Among the things that help out in the battle for lower cost of maintenance is the vulcanizing equipment, which permits of healing the wounds of the tires before "mildew" chews up the fabric. The Auto "Eleck-Trick" Vulcanizer (Fig. A), made by James L. Gibney & Brothers, Philadelphia, Pa., is offered to that class of autoists who prefer to consult the interest of their own pocketbook rather than to call upon the makers of tires for advice when it is too late to do anything else about it.

This vulcanizer is operated on the electrical principle, uses either direct or alternating current, and the voltage is that which is used in electric lighting everywhere.

BEFORE starting out for an extended tour, it is in the path of wisdom to examine the tool kit to note if all the wrenches are present and accounted for. The "Auto Clé," with its ten possibilities, is so designed that it will handle that number of different sizes of hexagon heads of nuts, and they may be tightened up in any position. As a socket wrench, the one as here illustrated (see Fig. B) is recommended for its utility, and it may be had from dealers who make a point of looking after the interests of customers, but the safest plan is to have a set (they come in a mahogany case) in the tool kit.

COMMON prudence demands that an extra set of tires be taken along, and how to store them is a matter that sorely puzzles the average autoist not a little. Nelson S. Gotshell, Chicago, Ill., having struggled with this matter, finally solved the problem in the manner as here shown, and he now offers the "Non-Stop Adjustable Tire Carrier" (C) to those who appreciate the thief-proof properties of a secure tire carrier. It is made in black enamel, polished brass, and nickel finish, and is taking hold of the affections of the autoists who have the least trouble on the road.

DEMAND for a satisfactory gas lighting system has been long and persistent, and the Motor Specialties Company, Motor Mart, Boston, offers a solution of this problem which has the endorsement of the New Englander, who is noted for his acumen. The "Flash Auto-Lighter," as shown at D, comprises a dashboard equipment which is compact, good-looking and rugged. The connections for the gas and battery are all on the back, so that they are accessible under the hood, back of the motor, but they are protected from the weather and the tinker. The lights are turned on or off by a single movement. using a lever, and the whole equipment is within easy reach of the man at the wheel.



(A) "Elec-Trick" Vulcanizer
(B) The Ten-Way "Auto-Cle"
(C) "Non-Stop Tire Carrier"
(D) The "Flash Auto-Lighter"
(E) N. O. B. Mills' Rubber-Lined Robes
(F) Usefuls for Home Auto Upholstery

EVERY autoist purchases his favorite car on a fine day, and he aims to take advantage of bright weather when he goes out for a ride. If he is caught in the rain it is possible that he will not be prepared for the worst. The Northern Ohio Blanket Mills, realizing that the sun will not shine all the time, make provision for inclement weather, and provide far-sighted autoists with all sorts of blankets and shawls, both warm and weather-proof, and in the many styles, one of which is here shown (E). Rubber lined robes are a prime favorite. They look well, keep out the wind, and last for years.

FOR the autoist who wants to do his own repair work to the upholstery of his automobile, or the body maker who deals in materials of this sort in a large way, the fasteners made by the United States Fastener Company, Boston, Mass., are offered in great variety, some of which are shown here (D). Many autoists, especially those who have a garage, a place for everything, and everything in its place, keep fasteners in one place; they come handy at an unexpected moment.

THE ease-loving automobile owner, who does his own driving, and yet balks at the job of pumping tires, will welcome the announcement of the Prest-O-Lite Company, of Indianapolis that they have perfected and placed on the market a new Prest-O-Tire tube, which in actual service has proven to be a veritable little giant in the filling of automobile tires. It is somewhat larger than the original type marketed by the company, carrying sufficient gas to satisfactorily inflate any of the larger size tires, above the 36 x 4, now coming into such general use. While this new Prest-O-Tire tube is a trifle bulkier than the early model, it is yet so small that a half-dozen tubes can easily be carried in a tool box, being only 1 5-8 inches in diameter and a foot long. The same puncturing valve can be used on both tire tubes, so that it is not necessary for a new valve to be purchased. It is sold upon the well-known Prest-O-Lite plan of exchange. That is, when exhausted it can be exchanged for a new one at almost any dealer's, merely by paying a small exchange fee, this scheme having proved eminently satisfactory in the company's Prest-O-Lite business.